JPRS 83481

17 May 1983

USSR Report

SCIENCE AND TECHNOLOGY POLICY

No. 13

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 83481

17 May 1983

USSR REPORT

SCIENCE AND TECHNOLOGY POLICY

No. 13

CONTENTS

USSR ACADEMY OF SCIENCES LISTS ACHIEVEMENTS

Moscow PRAVDA in Russian 4 Mar 83 p 3

[TASS report on USSR Academy of Sciences General Assembly: "Science Adjusts the Step"]

[Text] The higher the value the party puts on the work of scientists, the higher the demands it makes of an increase in their role in the country's technical-economic and social progress. This high responsibility of scientific personalities to the country was the topic at the annual general assembly of the USSR Academy of Sciences, which concluded on 3 March in Moscow.

The successes of scientists last year and problems of the organization of science and the strengthening of its ties to production were described in his introductory remarks by Academician A.P. Aleksandrov, president of the USSR Academy of Sciences. The CPSU Central Committee November Plenum and Comrade Yu.V. Andropov's speech cited, he said, the concrete tasks of an acceleration of scientific-technical progress. They are all within the capabilities of our scientists. It is only necessary to concentrate the efforts of the fundamental and applied sciences as much as possible on the accomplishment of these tasks, increase the efficiency of scientific developments and contribute in every way possible to an acceleration of their introduction in the practice of the most important sectors of the national economy and health care.

The president dwelt in detail on the successes of a number of research institutes which are actively feeding production with new ideas and techniques. The institutes of machine science, metallurgy and arc welding have considerable successes in the promotion of their developments in various sectors of engineering and metallurgy. A tremendous role in a fundamental modernization of metalworking processes has been performed by the Ukrainian Academy of Sciences. The work of Academician B.Ye. Paton and his collective has literally accomplished a revolution in the problem of increasing the strength of cutting instruments and accelerating the technology of gas pipeline installation.

Among the year's best work is the research of Siberian chemists into the creation of new catalysts and surfactants and the procedure of the accelerated activation analysis of geological tests directly under field conditions. Scientists' work in the sphere of high-energy physics is particularly impressive in the fundamental sections of science. Despite the fact that no new large-scale

accelerator has essentially been created in the country recently, nonetheless, appreciable results have been achieved, particularly in the sphere of strong and weak interaction in the microcosm, thanks to the successes of the theoreticians and experimenters.

Big tasks, the scientist said, confront economic science: it is essential to solve more boldly and actively the questions of production organization, price forming and an increase in social production efficiency which are now arising. It is necessary to enlist computers more extensively in the accomplishment of these tasks and strive for their more efficient use. And, finally, the president emphasized, it is necessary to pay more attention to questions of the academy's economic activity, cut short any violations of labor, production and financial discipline and adopt a solicitous attitude toward the resources which the state generously allocates for the development of scientific research.

A report on the activity of the Academy of Sciences in 1982 was delivered to those assembled by Academician G.K. Skryabin, chief academic secretary of the USSR Academy of Sciences Presidium. The past year, he said, was marked by a historic event in the life of the Soviet people--the 60th anniversary of the USSR. An impressive contribution to the creation and development of our multinational socialist power was made by Soviet science.

In the year under review the USSR Academy of Sciences, the union republic academies of sciences and other of the country's scientific establishments and VUZ's channeled efforts toward implementation of the decisions of the 26th CPSU Congress and subsequent CPSU Central Committee plenums and fulfillment of the 11th Five-Year Plan. A special joint session of the USSR Academy of Sciences General Assembly and the VASKhNIL General Assembly was devoted to an intensification of the role of science in realization of the USSR Food Program for the period through 1990. It outlined the most important directions and problems of scientific research of decisive significance for the further development of agriculture and the agrarian-industrial complex.

The speaker dwelt on certain scientific achievements of 1982. Thanks to the work of the Institute of Solid-State Physics and the Physico-Technical Institute imeni A.F. Ioffe, we succeeded in replacing mercury lamps with sodium lamps, which made it possible to more than halve power consumption in public lighting.

The Institute of High Temperatures in conjunction with the Atomic Energy Institute imeni I.V. Kurchatov performed a series of work on the creation of powerful solid-fuel pulse magnetohydrodynamic oscillators and the study of physical processes therein. The efficiency of the use of the magnetohydrodynamic method for probing the Earth's crust during fundamental geophysical research, the search for minerals and earthquake forecasting was shown.

New highly efficient antifriction materials and heat-resistant protective coverings appeared, and an original technique of the production of sulfuric acid from loosely concentrated exhaust gases from foundry shops was developed.

Last year was also fruitful for biologists working in the sphere of genetic engineering. They carried out complex research whose results serve as the

basis for the organization of the industrial manufacture of interferon. A strain of colon bacillus bearing a gene of man's growth hormone which does not exist in nature was synthesized.

The development of active cultures of microorganisms which are the producers of physiologically active compounds from the sphere of science fiction has become today's reality. And some of these cultures are already being used in production. Producer-strains of various nuclein exchange enzymes in quantities necessary for the country's requirements are being created, for example. They are being produced on an experimental installation of the Institute of Biochemistry and Physiology of Microorganisms.

Significant successes have been achieved in the sphere of Earth sciences. Geologists substantiated the prospects of the oil and gas content of East Siberia, where a number of oil and gas deposits were discovered. Large-scale deposits of potash salts in north Irkutsk Oblast and phosphorites in the region bordering Mongolia, which were discovered as a result of the forecasts of Siberian scientists, have reached the industrial exploration stage.

Among the achievements in the sphere of the social sciences the speaker mentioned the works evaluating the economic efficiency of economic measures and the completion of the multivolume works "History of World War II" and "Materialist Dialectics as the General Theory of Development". Such significant works as "Kievan Rus' and the Russian Principalities of the 12th-17th Centuries" and others were published.

As the speaker reported, in 1982 the academy paid great attention to the introduction of scientific achievements in the national economy. Work was performed on the realization of more than 1,500 highly efficient production processes and new materials and equipment. The scientist adduced concrete examples of developments introduced on the initiative of the USSR Academy of Sciences. At the same time he observed that the country is incurring big losses from the fact than many of the academic institutes' developments are not realized opportunely.

Soviet scientists performed a great deal of work abroad on an explanation of the decisions of the 26th CPSU Congress and the USSR's domestic and foreign policy. Great attention was paid here to the problems of consolidating peace and preventing the threat of nuclear war. Soviet scientists speak at international fora and in various movements against the threat of nuclear catastrophe from a high-minded position.

In conclusion G.K. Skryabin expressed confidence that the employees of the USSR Academy of Sciences would, like all Soviet scientists, successfully fulfill the plan quotas of the third year of the 11th Five-Year Plan and make a fitting contribution to realization of the historic decisions of the 26th CPSU Congress.

Debate on the report of the chief academic secretary of the USSR Academy of Sciences Presidium followed. The scientists touched on a broad range of problems connected with the development of this field of research or the other and discussed ways of the interaction of fundamental and applied science. Particular attention was paid in the debate to the question of the organization

of work in the Academy of Sciences on information science, computers and automation. A report on this subject was delivered by Academician Ye.P. Velikhov, vice president of the USSR Academy of Sciences. He noted the high state significance of this field for the acceleration of scientific-technical progress. The successes of Soviet scientists in solid-state physics, semiconductor theory and technology and quantum electronics are sufficient to ensure that this sector develop at an accelerated pace. The Soviet science school's prestige is also high in the sphere of computer software. This is why the task is now being set of maximum concentration of the efforts of all scientists of this field along a broad front.

The assembly adopted a decision on the organization of a Department of Information Science, Computers and Automation of the USSR Academy of Sciences within the USSR Academy of Sciences Presidium Physico-Technical and Mathematical Sciences section. In connection with the organization of the USSR Academy of Sciences Leningrad Scientific Center the assembly elected as its chairman Academician I.A. Glebov.

USSR Academy of Sciences' gold medals and prizes were then presented to the outstanding scientists. Winner of the Academy's highest award in the sphere of the natural sciences--the 1982 M.V. Lomonosov Gold Medal--Prof Dorothy Hodgkin, member of London's Royal Society and foreign member of the USSR Academy of Sciences, delivered a scientific paper.

The USSR Academy of Sciences General Assembly adopted an appeal to Soviet scientists. It expresses concern at the exacerbation of the international situation and the fate of peace and the assembly participants' unanimous support for the initiative of scientific establishments and VUZ's with respect to an all-union conference of scientists in defense of mankind against the threat of nuclear war and for disarmament and peace. The USSR Academy of Sciences Presidium is instructed to render the conference the utmost assistance, the intention being to raise scientists' role in the struggle to ensure the peoples' security and the peaceful use of scientific achievements to enhance people's well-being and improve living conditions in the world.

The general assembly called on Soviet scientists to apply all their forces and use their authority in the struggle against the threat of nuclear catastrophe and for lasting peace between peoples.

CPSU Central Committee Secretary M.V. Zimyanin and G.I. Marchuk, deputy chairman of the USSR Council of Ministers and chairman of the USSR State Committee for Science and Technology, participated in the session of the annual general assembly of the Academy of Sciences.

8850
CSO: 1814/67

MORAL STIMULATION OF SCIENTIST'S CREATIVITY URGED

Moscow PRAVDA in Russian 8 Feb 83 p 3

[Article by Prof. K. Puzynya, pro-rector for scientific work of the Leningrad Engineering-Economic Institute imeni Palmiro Togliatti and doctor of economics: "Not By Number But Ability"]

[Text] The economy's transition to an intensive path of development requires the same of science also. And considerable tasks here confront the research, design and planning organizations and VUZ's and the ministries and departments.

The country has thousands of scientific organizations. They are far from all fully justifying their purpose. In my view, the structure of their network and the subordination and work direction of many of them are in need of considerable improvement.

Currently personnel and other resources of science are dispersed at a multitude of scientific-technical organizations of various ministries, departments and regions. Work is performed mainly on one's "own" syllabi and is frequently not coordinated on a countrywide scale. This frequently leads to the multiple duplication of subject matter, unwarranted parallelism and excessive expenditure of forces and resources. It would seem worth introducing a serious extra-departmental analysis of their subject portfolios and fruitfulness, the precise determination of specialization and dependable cooperation with respect to many forms of work. It is useful to contemplate a redistribution of certain scientific-technical organizations among departments and regions.

It would also evidently be advisable to withdraw institutes tackling intersectorial scientific-technical problems from the jurisdiction of ministries and departments and to transfer them to the USSR State Committee for Science and Technology. As far as scientific organizations working on problems of a streamlining of management are concerned, I would like to support the proposal of V. Glushkov and Yu. Kanygin (PRAVDA for 13 December 1981) on the creation of a USSR state committee for control systems and the unification of these enterprises under its aegis. Then instead of the considerable number thereof, we could manage with a few highly skilled scientific collectives.

This would also create the conditions for the formation of efficient organizational structures of the scientific establishments themselves. The model

structures extensively employed currently are frequently highly extravagant and aimed at the formation of a full set of subdivisions "dependent" on the institute, even if they are not all that necessary. If the scientific research institute, design bureau and VUZ leaders themselves were to be granted the right to determine the rational "set" of departments, laboratories and sectors (within the limits of the allocated staffs and wage funds), more impressive results could be achieved in all respects.

The scientific (head) problem councils could participate more actively in the control of the subject matter and allocation of resources among the institutes. Coordinating the research and evaluating the prospects of the chosen areas of research and the impressiveness of the results that have been achieved are within their capabilities. However, the structure of such councils of varying level has also not been thought out, and they frequently prove captive to departmental trends and they lack resource potential and rights, as also, incidentally, serious duties, which is making them a kind of "interests club".

In refining the network of associations and scientific-technical organizations and creating new ones it is necessary to substantiate their advisable "dimensions" better. Giant-mania frequently "erodes" the institutes' specialization and slows down the quest for topical new directions.

Experience testifies to the expediency of the creation in many instances of small and medium-sized scientific and planning collectives precisely specialized and easily switchable to a new range of topics. For example, on the plus side of a number of such small scientific collectives as VUZ departments are the scientific novelty and originality of the developments and their patentability and value for practice. They frequently surpass in fruitfulness the well-equipped, but cumbersome sectorial institutes suffering from departmental limitations. What high results, on the other hand, may be obtained in VUZ collectives if their technical, material and data support were to be raised decisively! I believe that then in certain areas it would be perfectly possible to endow them with the rights of head organizations. Such instances already exist, incidentally.

These possibilities were reinforced with the creation in the RSFSR Ministry of Higher and Secondary Specialized Education of a financially autonomous scientific association. The concentration of forces and resources on the development of major problems within the framework of goal-oriented scientific-technical programs and territorial VUZ complexes, the maneuvering of resources and the elimination of unwarranted parallelism and duplication are stimulating VUZ science and raising the level of its industrialization and efficiency. The real possibility of the creation of interVUZ departments, laboratries and experimental works and of solving the collectives' social problems better is emerging in the system of this association's territorial VUZ complexes.

An important form of resources ensuring the success of scientific research, development and planning is scientific-technical information. A number of all-union and a large number of republic, territorial and sectorial (but essentially departmental) information centers and thousands of scientific-technical information departments at enterprises and in organizations are operating in the country. Nonetheless, the level of data support for scientific research and

experimental-design work is, in the opinion of specialists, low, while information losses are unduly great. This is a consequence of departmental disconnection and the manifold duplication of data stocks.

It would be advisable, I believe, for the information centers to specialize not according to their sectorial membership--ministry, department--but according to branch of learning, science and technology. They would come to be of an interdepartmental nature, operate on the principles of cost accounting and be under the jurisdiction of, say, the USSR State Committee for Science and Technology.

An improvement in data support for research requires an increase in the editions of scientific-technical literature and a reduction in the time taken to publish books, brochures, journals, collections of articles and conference and seminar material. It is necessary to introduce more boldly and extensively data carriers which lend themselves well to mechanization: preprints, magnetic film and cine film, microfiche and microfilm, computers and so forth. It is possible and necessary to enhance the information role of scientific-technical conferences, seminars and meetings.

Back in 1978 at an all-union conference on the scientific organization of labor in scientific establishments mention was made of the need to seek and introduce progressive methods of the performance of research, design and planning work. However, not enough has been done here in the years that have elapsed. For designers the basic equipment is, as before, the Kuhlmann drafting unit, and scientists and planners frequently lack research instruments, laboratory and testing equipment for simulation modeling, displays, plotters, duplicating equipment and various types of office equipment. At the same time the available instruments and equipment are often used inadequately, and pooling and mutual assistance between institutes here have not been organized.

Automated planning (SAPR) and research (ASNI) systems are being created in many sectors. In the current 5-year plan it is necessary to develop and introduce more than 200 SAPR. However, they must be based on preliminary analysis, regulation, optimization and standardization of the technology of the work which it has been resolved to automate. Unfortunately, the need for this is not always taken into consideration. The fear arises that the anticipated result might not be achieved, as was the case with enterprises' introduction of many ASU's.

Science's main resource is its personnel. The research, design and planning institutes are in acute need of a permanent influx of gifted and enterprising young specialists who have been trained for creative work. This problem has not been tackled in the best manner recently. The training process in the VUZ's has up to now traditionally been geared mainly to the assimilation of a large amount of knowledge and problem-solving methods and to a lesser extent to the development of creative capabilities, initiative and the ability to set tasks. People frequently end up in science not at the call of their heart and talent but in accordance with assignment depending on the composite average grade for the period of tuition. Frequently an unenterprising standout, who has preference, opts, it seems to him, for work in a scientific laboratory, which is more interesting and more tranquil than in production. Thus there is an ever increasing number of excellent scientific executants and increasingly few creative "disturbers of tranquillity".

Yet scientific quest is not only interesting, it is very difficult and turbulent. It requires total input and a constant exertion of effort. Scientific work is modern industry, data blocks, far from quiet laboratories and taut plans and deadlines. The scientist, like a good sportsman, must always keep himself "in shape" and, possessing information, seek out the new and propose the newest. It is such personnel which needs to be retained in the institutes.

Not only the material (which has already been written about in PRAVDA) but also the moral stimulation of the work of scientists, designers and planners awaits great attention. Finally, the attitude toward scientists and engineers as a reserve of available manpower is wrong. The flaws of production collectives and municipal services (in the sorting of vegetables and cleaning of municipal grounds and construction sites) are still frequently rectified with their help.

Successes in the intensification of science are largely determined by the qualifications of the specialists engaged in the forecasting, planning, organization, control and economics of scientific research, designing and planning. Engineer-economists and economists who have a sound knowledge of the specifics of scientific creativity are needed here.

It is necessary to use the paths and possibilities which might prompt all those employed in science and the planning sphere to strive persistently for an intensification of their work: make more scientific discoveries and inventions and create the latest equipment and technology surpassing the world standard. And do this not by numbers but by ability.

8850
CSO: 1814/68

ACADEMICIAN DESCRIBES TOMSK SCIENCE-PRODUCTION INNOVATIONS

Moscow SOVETSKAYA ROSSIYA in Russian 12 Jan 83 pp 1,2

[Special correspondents B. Ibrayev, V. Lysenko conversation with Academician V.Ye. Zuyev, chairman of the USSR Academy of Sciences Siberian Department Tomsk Branch Presidium: "What Local Quest Can Do"]

[Text] [Question] Vladimir Yevseyev, what difficulties arise in connection with the practical realization of scientific developments, of academic VUZ's and institutes in particular?

[Answer] Introduction is a fundamental and as yet unsolved question. Yuriy Vladimirovich Andropov spoke conclusively at the CPSU Central Committee November (1982) Plenum of the need to accelerate scientific-technical progress and introduce the achievements of science, technology and progressive experience in production extensively and rapidly. But he also emphasized that if we really want to advance the business of the introduction of new technology and new labor methods it is necessary to reveal and remove the concrete difficulties impeding scientific-technical progress.

What, in our view, do these difficulties consist of? I believe that a system of transferring science's results into practice has yet to be worked out. In our country the most important scientific forces are concentrated, as a rule, in academies of sciences and VUZ's. Such magnificent sectorial institutes as the celebrated Institute imeni I.V. Kurchatov are a great rarity. From the viewpoint of state interests the following would seem to be a natural chain of scientific-technical progress: academic institute--sectorial scientific research institute--plant. Because such a chain has yet to be created virtually anywhere, the number of major scientific developments obtained in the academic institutes and VUZ's which are not technologically embodied in national economy sectors is still considerable.

Here is an example from the work practice of the USSR Academy of Sciences Siberian Department Institute of Atmospheric Optics, which I head. We have been working for more than 10 years on the creation of new laser guidance systems for the reliable landing of aircraft and piloting of ships. With our own resources we have created prototpye models and confirmed the soundness and working capacity of ideas during tests at air- and seaports. Upon the introduction of our systems airports would virtually not have to close owing to meteorological conditions.

After all, what are "meteorological conditions"? Hurricane winds, but more often than not, 90 percent of the time, they are lack of the necessary visibility: fog, low clouds, heavy smoke. Or seaports, say, which are sometimes closed for 5-7 days owing to bad weather. This is, after all, a huge loss! We tested the system in Odessa back in 1976 and obtained excellent comments. However, despite all our persistence, it is many years now that we have been unable to break into the sectors with these undoubtedly promising developments.

We are told: produce just five systems with your own resources. But, first, this is not an academic institute's business and, second, were we to begin to produce them, we would immediately be diverting resources in short supply intended for the continuous refinement of new developments. We can try and understand the caution with which our development is received in the sectors: its introduction will require certain unplanned expenditure. But this would prove to have virtually immediate significant results. Why, then, in this case not agree to close interaction with our institute, why not take the trouble to manufacture these five systems themselves in order to remove all questions, if some people still have them?

[Question] The reason is not, of course, someone's premeditated position, but the imperfection of the very mechanism of the transfer of a scientific development into practice and an incorrect planning system....

[Answer] Absolutely. I believe that this problem could be solved thus. The State Committee for Science and Technology should have expert problem councils. Not on a public-service basis but performing their official duty, these councils would make systematic expert appraisals of the basic, most significant results of fundamental science. The main thing--the anticipated savings from introduction of the results--would be ascertained here, and a recommendation would be made on this basis to the USSR Gosplan for compilation of the national economic plan. As yet, however, the State Committee for Science and Technology passes on to the Gosplan merely a compendium of the corresponding proposals of the sectors.

Thus is the plan compiled. But essentially this is not a plan but simply a recording of what has taken shape. Here, I believe, is one of the difficulties which were spoken about conclusively at the CPSU Central Committee November (1982) Plenum and which need to be overcome.

A real plan should be built on a scientific basis. The state committee provides this basis, and the planning authorities revise it in their indicators, primarily economic indicators. For this the Gosplan should have the necessary specialists in the sphere of mathematical modeling in order to "crank up" different versions of the plan and select the optimum from the viewpoint of national economic interests. The sectors would not then dictate their terms to the Gosplan but would be the executors of its will.

This is one possible way. It is not simple but extraordinarily complex because it requires a new approach to the introduction of scientific achievements. It also requires to a certain extent a reorganization of the Committee for Science and Technology itself and the Gosplan and changes in their fundamental functions.

In addition, and this also was rightly discussed at the CPSU Central Committee November Plenum, we practically lack economic incentives in the introduction of the results of science both in the sectors and at each specific enterprise. Thanks to the mass introduction of scientific achievements, a Barnaul plant once secured the result of an increase in output not of several percent, as we usually plan, but of a factor of almost 2. Do you know how this at first ended? In the plant changing from a leader in the sector to the most lagging enterprise. Why? Because the yardstick in our country is not volume and not the product but how many rubles' worth of product have been produced. If, say, the plant was to have produced R100 million of products and did in fact produce such, fulfilling the plan for the production of commodity output to the tune of R50 million, it fulfilled its financial plan only 50 percent. For this reason all the economic indicators at the plant "fell headlong," and its workers lost all benefits--the 13th-month wage and so forth. This instead of this outstanding achievement being suitably commended. Here you have an example of clumsiness and lack of real incentives.

The situation concerning objective indicators is such that frequently a plant producing some old product in accordance with a well-run-in technique is not interested in a transition to a new one, even though its products do not have satisfactory sales. All bonuses and regalia and a "quiet life" depend on the existing scientific-technical level of the enterprise, and a departure therefrom is fraught with all kinds of negative consequences. This paradox also has to be overcome.

[Question] The mechanism of introduction is imperfect. Is this not why for some time now Tomsk Oblast has had its own, local version? Tell us about it, please.

[Answer] The true scientists always dreams that his idea and the results of his science will be applied extensively in practice. As we can see, a precise mechanism which would stimulate to the maximum the immediate, while still hot, introduction of a result obtained from fundamental science has not yet, as a whole, been formulated. It is therefore necessary to seek certain other paths. It seems to us that here in Tomsk Oblast, thanks to the extraordinarily active position of the obkom, we have really succeeded in formulating an efficient version of the breakup of departmental barriers and the creation of our own, Tomsk, mechanism of introduction.

The high authority of the obkom and its profound interest in an acceleration of scientific-technical progress have ensured the unification of the efforts of academic, VUZ and applied science with enterprises of the most varied sectors of the national economy. This unification took official organizational shape here more than 10 years ago, after an obkom bureau session had made the decision to create a scientific-coordination council under the auspices of the obkom which became the coordinator and leader of all this work. The council was set the task of creating programs uniting the efforts of all aspects of cooperation for the solution of major problems. The most significant programs are approved by the obkom, become obligatory for all, are periodically monitored and the appropriate decisions are adopted in respect of them.

The experience itself, like any experience, accumulated gradually. At first we simply coordinated the actions of all Tomsk's scientific establishments in order to rule out duplication. At the subsequent stage, that is, the entire 10th Five-Year Plan, industrial enterprises were within the orbit of our interests. Ten comprehensive goal-oriented programs have been fulfilled in close alliance with them. Among these, those of the largest scale are the programs for the automation of scientific research and production processes and powder metallurgy.

[Question] I would like made clear: among the 170 scientific-technical programs being implemented in the country are the above-mentioned two also. What is the relationship of your regional programs to the union programs?

[Answer] Ours, of course, use all the results of the union programs, but the difference is that they are considerably more specific from the viewpoint of actual introduction at specific enterprises and in associations and at industrial, construction and other facilities of the oblast's national economy. Thus our powder metallurgy program is headed by Viktor Yevgen'yevich Panin, deputy director of the Institute of Atmospheric Optics and corresponding member of the USSR Academy of Sciences. The program unites all academic institutes and a considerable proportion of the VUZ's and also 15 establishments and organizations. An industrial shop with new technology is operating in the "Tomskneft'" Association thanks to vigorous efforts. A similar shop in the very big "Khimstroy" Construction Administration is building up capacity.

[Question] Thus the entire activity of the obkom's Scientific-Coordinating Council is geared to the removal of interdepartmental barriers?

[Answer] Not solely. The main thing to which the council's role amounts is the highly authoritative, reliable and scientifically substantiated formulation of problems and programs, the allocation of forces and the determination of tasks. The party authorities cannot do all this themselves. As far as departmental barriers are concerned, here, of course, the obkom has the decisive role. In day-to-day work the council constantly turns to the obkom if congestion brought about by departmental interests arises. All enterprises, however, have plans and objective difficulties. The role of the council and its sections (each deals with a certain goal-oriented program) here is to provide the obkom with prompt information for the appropriate timely action.

Thus, for example, it was at a fundamentally important stage of realization of the program for the automation of scientific research and production processes when the participation of the city's industrial organizations in the development of certain components of the "KAMAK" standard--the material basis of automation--was made necessary. It was necessary to ensure that each enterprise performed its duties on time. We understood that simply assigning quotas in their departmental plans is far from signifying that matters will proceed of their own accord. It was necessary to bring the enterprise leaders together repeatedly. We in fact held council bureau sessions with the participation of obkom secretaries and under their chairmanship.

[Question] Obviously, the program also provided for the training of personnel?

[Answer] Of course. The point being that the very "KAMAK" standard concept was unknown to everyone. This apparatus appeared comparatively recently. Simultaneously with realization of the program we in the Institute of Atmospheric Optics organized a quarterly seminar-school at which we at first merely described what the "KAMAK" is. Plant executives and those directly responsible for introducing this program attended the classes. We then began receiving reports from the participants in the cooperation. The school found a new level, and traveling sessions in the localities and at enterprises became a characteristic feature thereof. Personnel had not been trained for the new work, and there was insufficient knowledge on the very material basis of automation. An external push and the surmounting of psychological barriers were needed. We are conducting such measures for training the personnel in each section, even if this is a more or less well-known problem.

[Question] Is this not distracting your branch's academic institutes from the development of fundamental scientific problems and are you not locking yourself within internal, oblast problems to the detriment of your main work?

[Answer] We are of course not departing from the solution of the main, fundamental problems which we have been authorized to study. All the programs without exception have been formulated such that they afford the results of fundamental science an outlet into the practice of the region. We are not engaged in science for the region, we are engaged in fundamental science, and its results have no regional limits. But the practical outlet is regional, although it could be even more extensive, when the appropriate stimulating mechanism has been developed. I do not doubt that this will inevitably occur, and in the near future, moreover.

8850
CSO: 1814/65

MATERIAL INCENTIVES FOR LABORATORY SCIENTISTS

Tbilisi ZARYA VOSTOKA in Russian 18 Feb 83 p 2

[Article by Ketevan Amiredzhibi: "Two Levels of Efficiency"]

[Text] Under the conditions of developed socialism the higher school is called on to exert a more active influence on an acceleration of scientific-technical progress. It is not fortuitous that among the tasks set the scientists of Tbilisi State University there are two that are termed as basic. It is a question of the extensive development of fundamental research into the basic directions of the natural, technical and social sciences and the contribution to realization of the Food Program. And from precisely these fundamental directions ensues another important requirement, which was emphasized particularly forcefully at the CPSU Central Committee November (1982) Plenum and the Georgian Communist Party Central Committee Sixth and 11th plenums--the strengthening of science's relations with production.

Material in the new column "The VUZ: Research to Production," which ZARYA VOSTOKA is beginning today, will give the reader a chance to periodically familiarize himself with the directions of the scientific quest of scientists of the republic's higher school, new developments of important practical interest and new forms of the integration of the scientists' forces with production workers making it possible to raise the level of use of the scientific potential of the VUZ scientific subdivisions and concentrate efforts on the solution of large-scale national economic problems.

Five years ago, more precisely, late in the evening of 31 December, Tbilisi was alive with its customary holidary concerns, counting off the hours of the department year. A group of scientists of the Tbilisi State University Biochemistry Department led by Prof Nugzar Aleksidze, head of the department, was also engaged in a time count, but in a somewhat different measurement:

the "i"s" were finally being dotted at that time--development of the technology of decolorized protein had finally been completed. The wheels of science accelerated their revolution....

It is time to speak of the goal and essence of the very development concerning the so-called "protein" problem. A quantitative scarcity of protein is to be observed in the world currently. And given all this, the qualitative inferiority of this vitally important product--irreplaceable, difficult to reproduce and costly--is also beginning to perform an increasingly negative role. It is for this reason that the task of obtaining protein from new sources and secondary raw material is so acute. Georgian specialists have succeeded in overcoming a number of difficulties: new technological approaches have guaranteed the harmlessness of the final protein products and an inexpensive method of obtaining them. The chemical composition and biological properties of the new proteins, which are promising for nutritive use, have also undergone comprehensive analytical study. The group of scientists is developing yet another scientific problem which is also of tremendous practical significance. They are providing for the processing of secondary waste of meat and dairy industry and agriculture for livestock fattening. As a result 25 percent of the fodder may be saved and the animal weight gain may be increased by up to 30 percent on the republic's farms.

Wise Biblical prophets foretold of events sufficiently far removed in time and space that at verification time there would be no gushing rocks. It is more difficult for the scientists than for the prophets: their research, and that of an applied nature all the more so, has to be introduced in practice in as short a time as possible. Incidentally, one too often sees with one's own eyes how the final step--the step toward industrial production--is not taken, and this devalues the entire previous path. How many times one makes the acquaintance of people engaged in interesting scientific work. Results are to hand, as yet only in the laboratory, it is true. But the authors of the development, like blindly devoted parents, do not wish to let go of the child. Yet the purely scientific problems there have gradually changed into engineering problems, and these into problems of introduction.... The entire point here, evidently, is that the scientists treasure not so much their own "child" as their own tranquillity, believing that there are no particular laurels to be won in this field, worrying about introduction: too much effort goes on explaining to this ministry or plant leader or the other the importance and significance of the results which have been obtained.... Well, an old issue, old problems, but they are being approached, and the experience of the work of the scientific group of biological engineers persuades one of this, in a new way today: creatively and efficiently and by proceeding from the main demand--science must operate profitably.

This task, which was put forward at the Georgian Communist Party Central Committee Sixth Plenum, also applies in full to VUZ science. The republic's VUZ's have scientific personnel of various branches of learning, and there are the conditions here for the development of large-scale national economic problems. Proceeding from this, every VUZ department and laboratory and every scientist must endeavor to see the "existence on Earth" of his own development and do all within his power to ensure that it come to pass.

An aspiration to active scientific quest and organizational support for the questions being tackled in the department distinguishes the work style of its head. A simple example. Nugzar Aleksidze is carrying out intensive fundamental research with respect to problems of memory and at the same time has initiated wide-ranging research actively aimed at the accomplishment of important national economic tasks, enlisting, which is very important, the forces of the production workers.

On that memorable New Year's Eve of 1978 together with N. Aleksidze was Temur Mdinaradze--then chief production engineer of the Georgian SSR Ministry of Meat and Dairy Industry Tbilisi "Tbilmyaso" Production Association. His participation in the development of obtaining protein was not fortuitous: a candidate of technical sciences, Mdinaradze is not only an equal partner of the head of the department in generating scientific ideas and their realization, the possibility of testing the obtained results under production conditions was created by his efforts. Evidently it was a combination of active character and striking intuition, a capacity for rapidly evaluating the possibilities of this scientific direction or the other with regard for the use in practice of what has been achieved, devotion to science, organizer's thinking and purely human qualities which ultimately formed their distinctive duet. A number of fundamental studies was conducted jointly.

In addition to those dealt with earlier methods of obtaining a special substitute based on animals' whole clarified blood making it possible to preserve all the vitally important substances in the flesh were developed. Methods were also developed for obtaining a whole-milk substitute for young stock based on the blood of slaughtered animals. Preliminary results show that this will afford an opportunity for weaning young pigs away from their mother's milk not at the age of 2 months, as it usual, but in 2 weeks and promotes the maximum survival of the weakest of them. A new type of fodder was created jointly on the basis of agricultural and butter production waste. They have succeeded in finding substitutes for industrial animal fats in short supply and so forth.

T. Mdinaradze's scientific collaboration with N. Aleksidze has changed T. Mdinaradze's work biography sharply. He is now head of Tbilisi State University's biological engineering laboratory. In conjunction with N. Aleksidze he has in a short time become the author of four inventions and several scientific articles. In fact, such a reorientation is characteristic not just of Mdinaradze but of some other production workers also.

N. Aleksidze explains production workers' introduction to science by the following factors:

"The knowledge and practical experience of the production workers have proven necessary to science, and they themselves have been fascinated by the large-scale tasks set by the scientists. The new form of science's integration with production, which is now gaining authority in the republic, has also contributed to the revelation of the creative potential of the man from production. It is a question of partnership. Within a partnership framework we are developing topics of tremendous national economic interest.

Close attention was paid to the development of the new form of science's integration with production--partnership--at the Georgian Communist Party Central Committee Sixth Plenum. It has a number of inestimable advantages: the partners are not afraid of departmental barriers. Not only the creative interest of the scientists but also the production workers themselves is set in motion in this case. There is increased material stimulation of the scientific organizations participating in the development and introduction of the results of the research.

The 1981-1985 interVUZ comprehensive work program on "The Use of Secondary Waste of the Fats Industry and Municipal-Consumer Services for Feed and Nutritive Purposes" has already been approved. The program's scientific leaders are N. Aleksidze and T. Mdinaradze. The program itself implies fulfillment of more than a dozen topics. For example, economic calculations and substantiation of the need for the creation of new production lines for obtaining fodder from nonfood secondary waste and also high-calorie rations for feeding agricultural animals have been entrusted to several organizations: the Tbilisi State University, the Georgian Zootechnical-Veterinary Training-Research Institute, the Georgian Polytechnical Institute imeni V.I. Lenin, the Kutaisi Polytechnical Institute and so forth. The specified time of fulfillment is 5 years. Also determined are the financing organizations--the ministries of agriculture and meat and diary industry. Or one further topic--the elaboration of blueprints and the creation of new production lines for the use of secondary waste whose application hitherto has been ineffective. In addition to the basic developers specialists of a number of planning-design bureaus and the Rustavi Foundry have been enlisted here. The anticipated economic and social results have already been formulated: fulfillment of this section of the program will contribute to the maximum use of waste for the creation of fodder resources, which, in turn, will afford an opportunity for a sharp reduction in expenditure during the production of meat and meat and dairy products and will be reflected in an increase in the productiveness of agricultural animals. The processing of all valuable waste will be provided for and the prerequisites for the organization of waste-free production will be created.

It is believed, and fairly, that the results of ideas and research that has been conducted cannot be evaluated immediately. Time is repudiating this quite settled opinion.

An example is the appearance within a very short time in practice of the results of the research of the biochemists. It is not only a matter here of the scientific competence of the specialists themselves and their enthusiasm and ability to interest the necessary organizations in the values of their own developments. Enthusiasts there have been and will be--there is no problem here. What is needed is the tremendous interest and support of the party authorities and various organizations and departments of the republic. We would recall: the task of the as yet unresolved problem of the utilization and application of secondary waste in hog-breeding complexes was set a little more than a year ago. The basic parameters making it possible to obtain a feed product of high biological value and to use it as a filler of various types of fodder have been revealed in this time, which is comparatively short for the solution of a most complex problem.

The results of the research and the prospects revealed upon the extensive practical introduction of the developments were carefully analyzed. As a result an experimental biological engineering laboratory was created under the auspices of the Tbilisi State University Biochemistry Department. The leading department of the laboratory (Gennadiy Soltan, chief) has developed the specifications for the extensive introduction of the results of the research. The number of specialists--executants of the topics--has been increased.

Special regulations governing the laboratory's activity were elaborated with the participation of ministries and departments. The basis thereof is the principle of material encouragement depending on the final results which are obtained. The laboratory is an independent, financially autonomous unit and enjoys the status of a legal entity. Considering the scale of the research being conducted, its leadership is exercised by a scientific-technical council. The chairman of the council is the scientific leader. This function has been entrusted to N. Aleksidze, who directly leads the collective of scientists, forms the plans of scientific research and experimental design work, monitors the course of introduction and the activity of all executants of the topics and directs the work of the graduate students, trainees and students.

The close attention which is paid here to a young shoot of science is by no means fortuitous. Exerting an active influence on an acceleration of scientific-technical progress, the higher school is obliged to display constant concern for a further strengthening of scientific potential and graduate creatively inquiring specialists capable of tackling the most complex production questions. The laboratory's activity within a partnership framework will make it possible to train biological engineer personnel, the need for which grows with every year. This approach, incidentally, is also bearing fruit. Thus Tamara Kiguradze, a fourth course student of the Tbilisi State University Biology Faculty, was awarded a Moscow State University testimonial for development of the topic "Use of Meat Substitutes Based on the Whole Blood of Slaughtered Animals". Nino Chogovadze, a student of the same faculty, is now developing the topic "Biochemical Treatment of Agricultural Waste," and the future biological engineer Giya Mandzhgaladze is studying questions of obtaining fuel from animal husbandry complex waste. All these topics are directly linked with the set of problems of the laboratory.

T. Mdinaradze, chief of the laboratory, is endowed with the right to dispose of all the material resources within the limits of the confirmed plans and estimates, select executant cnadidates and so forth. The broad rights granted the laboratory leadership make it possible to ensure the novelty and promising nature of the research and to direct the collective toward an increase in responsibility, creative assertiveness and performance discipline.

Two forms of remuneration have been established in the laboratory: time-plus-bonus and by-the-job. The first is employed exclusively for the laboratory's staff employees: their salaries are determined in accordance with current outlines. Within the limits of the established wage fund the laboratory leadership is accorded the right to pay staff employees bonuses in the amount of the monthly salary. Engaged, for example, in questions of the use in

sausage and meat products of meat substitute based on whole blood, Leyla Giorgobiani, head of a department, and senior engineer Bella Zautashvili have been recommended for bonuses. Junior research assistants Yelena Davidova and Shushana Dolidze will be given bonuses in the same amount for work on the techniques of obtaining protein.

The by-the-job form of remuneration is employed exclusively for invited highly qualified scientists and specialists. The number of such participants in a development and the piece rate are determined (following coordination with the trade union committee) by the laboratory leadership within the limits of the wage fund earmarked for a concrete topic. In the period when the work is being performed the specialists are paid the guaranteed salary of the staff employees, and the final settlement in accordance with the contracted job order is made after acceptance of the entire volume of work.

The rights and duties and degree of responsibility of the partners are clearly defined. For example, given the laboratory's substandard fulfillment of the terms of a contract or disruptions of work deadlines and also in the event of cancellation of a contract through the fault of the laboratory, the client pays off only the expenditure connected with payment of the guaranteed minimum wage of the executants of the topic. In the event of cancellation of a contract through the fault of the client, he pays off the expenditure on the topic at the time of cancellation of the contract and also transfers to the laboratory's account the unutilized part of the wage fund envisaged by the estimated expenditure for the topic as a whole. For the purpose of increasing the material interest of the laboratory specialists, invited assistants and also production workers participating directly in the introduction of the results of scientific and experimental design developments a special material incentive system has been established: 3 years following the introduction of the development in production practice the enterprise where the introduction was effected transfers to the laboratory's account 30 percent of the additional profit which it has actually obtained. This sum is distributed equally among the material incentive fund, sociocultural measures fund, laboratory development fund and so forth.

The new system of material stimulation of the workers of the biological engineering laboratory is now being introduced within the farmework of the experiment. How effective the results will be, time will tell. However, the first steps are highly promising: it is already clear that the principle of the scientists' and production workers' material interest, which is being observed most consistently and operating most efficiently, is making it possible to develop broad initiative and approach matters with a sense of profound responsibility, professionally, boldly and innovatively.

When, for example, the technology of a highly nutritional protein isolate was developed by the efforts of biologists, chemists and physicists in the shortest possible time or the question of official approval of a new type of feed under the semi-industrial conditions of the Krtsanisskiy Hog-Raising Complex aose, the leadership of the complex, particularly its director, Tristan Chrelashvili, candidate of veterinary sciences, and chief animal specialists Elgudzha Melikishvili created all the conditions for the scientists'

work, including even the conducting of experiments. Gogi Kuparadze, junior research assistant of the biological engineering laboratory and candidate of agricultural sciences, and senior engineer Malkhaz Bochoradze had literally to be retrained as workers to look after the animals. In this same period a new milk substitute, which is intended for offspring and which makes it possible to reduce the feeding time considerably, was officially approved also. The scientists and workers of the complex worked conscientiously. Their results were stimulated materially. The work gained as a result: the technique underwent the tests successfully and will be introduced in the current year on a broad scale.

Here, on the territory of the complex, an experimental center for processing the waste of that same hog-raising complex from which new types of plastic are manufactured was stationed. The techniques of obtaining them were developed in the biological engineering laboratory with the participation of chemists. The center was organized in a very short time. This was to the undoubted credit of a commission which was set up, which is headed by executives of the republic Ministry of Agriculture and the Glavsnab. The first products have already been produced.

The scientist is dependent in his work, dependent on many factors: work conditions, equipment, finances.... It is for this reason that it is so important to create for scientist collectives opportunities for the realization of scientific ideas. Such a truly party, professional approach has taken shape today in the republic. The details of the scientific subject matter and the ways and methods of research are not dictated to the scientists. This aspect of activity is the prerogative of the scientists themselves. They are helped organizationally. And it is not fortuitous that new ideas which will form the foundation of tomorrow's science and prove to be the solution of many important national economic problems are now crystallizing in the biological engineering laboratory.

8850
CSO: 1814/68

INTERDEPARTMENTAL COMPLEXES FORMED IN LVOV TO TACKLE SCIENCE-PRODUCTION PROBLEMS

Moscow TRUD in Russian 1 Mar 83 p 2

[Article by Ya. Podstrigach, member of the Ukrainian SSR Academy of Sciences and chairman of the UkSSR Academy of Sciences Western Scientific Center: "At the Intersection of the Sectors"]

[Text] L'vov--Oil, gas, coal and metallic ores are produced on the territory of Ukraine's western oblasts. In order to get at the minerals it is necessary to drill many kilometers into the Earth's crust, which consists of the most varied rocks. The drilling is performed with the help of so-called rock-breaking tools. They have to have special qualities: high strength and wear-resistance. Our coal industry lacked tools which conformed to the modern requirements.

Scientists of the UkSSR Academy of Sciences L'vov Physico-Mechanical Institute embarked on solving the problem. They developed a comprehensive goal-oriented program in which the entire process of work on the new tools was set out literally shelf by shelf. But it was impossible for just one institute to implement this program. And, indeed, would have been irrational--striving to solve a complex scientific-technical problem in isolation when major scientific forces are concentrated in the region: 25 VUZ's, 18 academic institutes and 30 sectorial scientific research institutes. The difficulty here is that they are under the jurisdiction of various ministries and departments.

Consequently, it is necessary to unite forces in a single powerful striking force, irrespective of their departmental allegiance. How to achieve this? The compilers of the program had to find a point of contact for the scientific organizations. The Physico-Mechanical Institute, as the head institute, set about the development of the technology of the manufacture of the structure of the rock-breaking tools themselves. The Ivano-Frankovsk Oil and Gas Institute began work on the creation of a high-strength surface layer on the tools. The L'vov Polytechnical Institute, which has major developments to its credit in the sphere of automation, suggested how to automate the assembly of the tools' components. The L'vov Forestry Engineering Institute Machinery Parts Department also made a contribution: it developed a method of reinforcing the rock-breaking tools.

That is, questions disturbing several scientific establishments and a number of production collectives were summarized in a single task--creating material

of high strength and wear-resistance. A point of application of the joint forces was found. The "Nedra" Interdepartmental Science-Production Association was born on this basis.

The close cooperation and general concern rapidly produced tangible results. A test batch of the tools has now been manufactured. Tests have shown that they are on a par with the best world standards. Production capacity is being prepared in the oblast for the series manufacture of these products.

More than 20 similar associations have already been set up in our region. Each of them is headed by a scientific-technical council. It directs all the research, keeps an eye on fulfillment of the program and helps move the scientists' developments into production. The councils are made up of leading scientists of the institutes, leaders of enterprises and chiefs of the obkom's sectorial departments.

The experience of the associations' activity has proven their viability, but also revealed certain shortcomings. First, they cannot "clutch at" every problem. Second, since the science-production associations are "enclosed" in certain enterprises their developments do not enjoy further extensive introduction, although are often of significance for the entire sector.

In order to eliminate these shortcomings and at the same time preserve all the advantages of the associations the scientists of the UkSSR Academy of Sciences Western Scientific Center decided to create interdepartmental complexes. How are they fundamentally different from the associations? The complexes will tackle the solution of more major, fundamental problems common for many enterprises of various ministries and departments of the region. For example, several associations were merged in the engineering complex--the "Nedra," "Sel'khozmash," "Avtoprom" and "Khimmash". I have already said what the "Nedra" has been working on. Research has been conducted in the "Avtoprom" into an improvement in hydraulic systems and hydraulic transmissions in buses, crane trucks and so forth. More reliable mounted mechanisms for agricultural equipment have been designed and technology for reinforcing parts has been developed and introduced in the "Sel'khozmash".

In joining the complex the associations have been able to the problems troubling them on a qualitatively higher basis. After all, drilling installations need not only high-strength tools but also reliable hydraulics, and in buses and crane trucks there are many parts which have to be wear-resistant and reliable. The same applies to agricultural equipment also.

The complexes have great scientific potential. The tasks on whose accomplishment they are embarking are, as a rule, of intersectorial significance, and for this reason permanent ties to the ministries are maintained. Leadership of the complexes is exercised by a board, which operates in accordance with the same principle as the association council, but, naturally, at a higher level.

Each complex is working in accordance with a goal-oriented program. The program is coordinated with the ministry, and it allocates resources for the research. Thus the appropriate ministry allocated the necessary resources for realization

of a program for an improvement in the techniques of the manufacture of electron beam instruments. The Interdepartmental Instrument-Making Complex has enlisted a broad range of specialists in the work. The technology which has been created is not inferior to foreign technology in a number of parameters. The savings from its introduction has constituted R20 million. The ministry immediately began to disseminate the experience of the manufacture of this product on a sectorwide scale.

Creating new technology and machinery is only half the matter. The main thing is introducing the innovation in production. The cycle from idea to its materialization in series production has accelerated more than twofold here. How have we been able to reduce the introduction time? For example, at the time of the creation of the rock-breaking drilling tools in the "Nedra" Association an interdepartmental laboratory was set up at the Drogobych Drill Bit Plant. The scientists produced the developments, and the enterprise, with the help of the laboratory assistants, promptly realized them.

Approximately 50 interdepartmental laboratories are currently operating within the framework of the associations and complexes. They serve as a kind of channel through which the innovations created by the specialists merge into production. The majority of the laboratories operates on a contractual basis. That is, whoever is interested in the solution of a problem allocates the people, equipment and money.

There is much testimony to the obvious benefits of such laboratories. For example, a joint collective of scientists and production workers helped the Drogobych Special Equipment Experimental-Mechanical Plant create a new technique of the heat treatment of high-strength drill pipes. This reduced by 7 years the time taken to organize large-scale series production and saved the state approximately R8 million.

The experience of the interdepartmental goal-oriented science-production complexes shows that we have selected a dependable key to the control of scientific-technical progress on the scale of the region. In the 6 years of their existence the complexes have produced for the state a savings of almost R300 million. The number of techniques, materials and scientific developments introduced has tripled. The solution of global production problems is making it possible to switch the enterprises to more accomplished technical-economic tracks.

At the same time the activity of complexes has engendered a number of problems. There is as yet a lack of documents regulating from the legal viewpoint relations between the interdepartmental formations. In conjunction with other scientific research establishments the USSR Academy of Sciences Institute of Economics L'vov Department has begun to elaborate recommendations concerning the further development of forms of regional interdepartmental cooperation. It would be desirable for these documents to be not of a local but an all-union nature. For this they must be approved by the USSR State Committee for Science and Technology.

Small enterprises and scientific research institutes are as yet beyond the sphere of activity of the complexes. But there are very many of them on the

territory of our region and they are in greater need of retooling and modern technology than the major plants. We are currently seeking organizational forms which will help us extensively enlist the "small" production facilities and scientific research institutes in our interdepartmental cooperation.

The time has come to take a different look at the efficiency of scientific research in the sphere of agriculture. Hitherto claims for the development of this problem or the other came from individual farms. This leads to pettiness of subject matter and parallelism and disperses scientific forces. It is evidently necessary to switch more rapidly to the organization of joint research on the scale of the entire agricultural complex. The oblast Agrarian-Industrial Complex Council should act as the general client and coordinator of all work.

8850
CSO: 1814/65

CONSERVATISM OF CERTAIN MANAGERS IMPEDING PROGRESS

Moscow PRAVDA in Russian 1 Feb 83 p 1

[Editorial: "Support for What is New and Progressive"]

[Text] The country's labor collectives have adopted high socialist pledges for 1983. This testifies that our party's firm policy of a further upsurge of Soviet people's well-being is a powerful stimulus to the constant growth of the labor and political assertiveness of the communists and all working people of the country. The primary duty of the party organizations and committees is striving to ensure that the accumulated positive experience, patriotic initiatives and interesting new schemes be used skillfully and proprietorially for the successful realization of immediate tasks.

We possess big reserves in the national economy. "These reserves," Comrade Yu.V. Andropov observed at the CPSU Central Committee November (1982) Plenum, "must be sought in an acceleration of scientific-technical progress and the extensive and rapid introduction in production of the achievements of science, technology and progressive experience."

Many party organizations and committees constantly keep questions of the introduction of new equipment and new methods of labor at the center of their attention. The practice of the party organizations of the capital and Moscow Oblast is instructive in this respect. A precise system of work on the retooling of production facilities and propaganda and dissemination of the experience of innovators has taken shape here. Problems of strengthening science's ties to production, a refinement of technology and enterprise modernization are examined regularly at meetings of communists and party committee bureau sessions. As a result thousands of shops and sections were mechanized and automated and many splendid undertakings were born and extensively disseminated in recent years alone.

Every party organization and every party committee has a rich arsenal of resources for influencing in active and businesslike manner the fate of an innovation and the dissemination of the experience of pacesetters. Commissions for the introduction of new equipment are operating successfully, for example, at major enterprises of Leningrad and Khar'kov. With their assistance the party committees constantly monitor how production is being streamlined and whether the plans of its retooling are being implemented. In many places efficient use

is made of manager's reports, permanent production meetings, professional competitions, schools of progressive experience and technical creativity reviews.

The introduction of progressive technology and the experience of the right-flank men of socialist competition frequently means a considerable break with obsolete ideas, a difficult surmounting of the psychological barrier and at the same time a revolution in forms and methods of work. This is why it is important that the party organizations and committees constantly foster in people, primarily executive personnel, a feeling for what is new, without which modern production cannot be run successfully in our time.

For example, certain measures for streamlining the economic mechanism provide for the establishment for ministries, associations and enterprises of official targets with respect to the introduction of progressive experience in the sphere of technology, the scientific organization of labor, production and management. What specifically has been done in this sector or the other and its collectives? Or take the introduction of the brigade form of the organization of labor, which is to become the basic form in the present 5-year plan even. It is no secret that in some places much is being said about it, but not enough being done. The fulfillment of counterplans and also collective contracts must be put under strict party supervision and organization of the work of the efficiency experts and inventors must be improved.

Particular attention should be paid to the scientific establishments and the strengthening of their relations with production. Two-thirds of the labor productivity increase was achieved, as an Estonian Communist Party Central Committee plenum observed, merely thanks to the introduction of the achievements of science and technology in the republic. At the same time the work of many sectorial scientific research institutes and design bureaus was sharply criticized. Instead of serious research work, certain scientific centers are engaged in the collection and processing of a variety of reports. We cannot be reconciled to such a situation.

Some places in our country have not learned, in Lenin's words, "to work systematically, using their own experience and their own practice." Each collective and each city has its own pacesetters and innovators working there and models of a creative attitude toward work. However, propaganda of their practice is not always underpinned by painstaking organizing work. Some places operate according to the principle: make a bit of a noise and forget about it. As a result of this approach initiative is blunted and interest in innovation and a useful undertaking is lost. This is precisely what happened, for example, with the 1,000-ton miners' brigades in Voroshilovgrad and certain other oblasts, where there has been a marked decline in their number recently.

Promotion of what is new and progressive is often impeded by the conservative thinking of certain managers. This was pointedly discussed at many of the communists' report and election meetings and party committee plenums. It is necessary to organize precise party supervision of how critical observations are being realized and what measures are being adopted for an improvement in matters.

An atmosphere of an attentive and at the same time exacting attitude toward each worker actively contributes to the introduction of the new and the progressive. Concerned for the creation at work of an atmosphere of creative quest, the primary party organizations are called on to support in businesslike manner the efficiency experts and inventors and all who are making a personal contribution to the acceleration of scientific-technical progress, an improvement in the organization of labor and the strengthening of order and discipline.

Making socialist competition for the successful fulfillment of the plans and socialist pledges for 1983 widespread, the communists and all working people of our country are profoundly aware that difficult and strenuous work on an increase in the efficiency of production and its intensification lies ahead. Accelerating the practical introduction of the achievements of science and technology and progressive experience, the party organizations and committees and labor collectives will strive for new successes in realization of the decisions of the 26th CPSU Congress.

8850
CSO: 1814/69

MORE ATTENTION TO ACADEMIC SCIENCE URGED

Moscow SOVETSKAYA ROSSIYA in Russian 11 Mar 83 p 1

[Article by Academician V. Koptyug, chairman of the USSR Academy of Sciences Siberian Department: "Barriers at the Stages of Introduction"]

[Text] Last fall at a gas well in the south of the country a critical situation came about--attempts had been made for 6 weeks to subdue a powerful blazing fountain by traditional fire-fighting equipment, but without success. And it was then resolved to try the blast eddy-mill powder method developed by scientists of the USSR Academy of Sciences Siberian Department Institute of Hydrodynamics in conjunction with the Novosibirsk Oblispolkom Internal Affairs Administration Fire-Protection Administration. It took only a day to put out the fire. This is an example of how academic science is finding a direct outlet into practice. And, furthermore, it very often makes it possible not simply to improve but, as in this case, cardinally change the situation. And this is perfectly natural. The accelerated development of fundamental science, its constant "front running" and its imagination, that is, precisely its fundamental nature, are helping discover /fundamentally/ [boldface] new ways of tackling practical tasks.

I will give one further example. The intensive scientific research performed in the USSR Academy of Sciences Siberian Department Catalysis Institute has discovered fundamentally new forms of the organization of catalytic processes--with nonstationary, program-controllable characteristics. Thanks to this, an opportunity has emerged for efficiently extracting sulfur from industrial production exhaust gases and utilizing in the interests of thermal power engineering low-calorie gas mixtures, including mine gases even, which were earlier discharged into the atmosphere. And in the traditional process of sulfuric acid production the nonstationary characteristics make it possible to reduce capital expenditure on the construction of installations many times over.

I would like to draw attention to one further singularity of the results of fundamental research--the plurality and "fan-like" nature of their emergence in the production sphere. Thus the development by Academician M.A. Lavrent'yev and subsequently by his students in the USSR Academy of Sciences Siberian Department Institute of Hydrodynamics of the theory of fast-moving processes, including the explosion, have summoned into being a cascade of engineering

solutions in various sectors: the hardening, welding and pressing of metal products, blast-induced powder extrusion, the removal from components of barbs and the application of powder coatings with the help of detonation waves, the blast molding method in the laying of high-voltage wires and the above-mentioned extinguishing of fires at gas and oil wells with the help of a blast-induced vortex ring.

In a word, the high practical returns from fundamental research do not, it would seem, have to be proved. And in this respect we cannot fail to be disturbed by questions concerning the financing of and material support for academic science. The tendency of a lag in the rate of increase in the budget financing of research behind the growth of the volume of work being performed has been discerned in recent years, which is confronting the institutes with the need to increase the proportion of business contract subject matter, which is in many cases of a comparatively narrowly oriented nature, and the excessive growth thereof could undermine the basis of fundamental research. This tendency is holding back to a certain extent the further development of academic science in Siberia. Can it be considered normal that such economically important areas as the Kuzbass, Tyumen', Omsk and Altay are not in practice embraced by a system of academic establishments? The Siberian Department is performing a great deal of work in this field, but new institutes and subdivisions are being created, as a rule, without the specific allocation of additional resources and assistants. As a result many of the subdivisions which have been set up have not achieved dimensions ensuring their normal functioning and have found themselves frozen indefinitely.

In this respect sectorial science's situation is more favorable. In terms of financing, material-technical support and the numbers of workers it sometimes surpasses academic science considerably in a number of sectors. However, it has its own problems. An acute one is the comparatively low personnel potential of the scientific research and design organizations located on the periphery. For example, in Siberia such organizations have 3.5 times more employees than the USSR Academy of Sciences Siberian Department and 3 times fewer doctors of sciences. After all, it is this strike force of science with high creative potential which ensures the fruitfulness of the work.

The USSR Academy of Sciences Siberian Department has accumulated great experience of interaction with sectorial science. The system that has taken shape includes cooperation both within the framework of direct contracts and via comprehensive coordination plans which are compiled by our department in conjunction with the ministries. The example of the cooperation of academic, sectorial and VUZ science in fulfillment of the large-scale "Siberia" comprehensive regional program is very interesting. But there are also barriers here frequently impeding the advancement of new ideas,

One such is the monopoly position of the head sectorial institutes. In accordance with the existing procedure, no single development proposed to a ministry could be introduced in production without their support. This is a kind of defense mechanism which makes it possible to avoid the adoption of insufficiently developed or erroneous decisions. Unfortunately, it permits the head institutes to occupy a "little worse, but our own" position, which is inevitably reflected

in the fate of new developments proposed by "others'" organizations. We will succeed in solving this problem, possibly, by enhancing the role of extradepartmental appraisal of the level of new developments and extending the opportunities for influencing the sectors of the USSR State Committee for Science and Technology.

However, production itself or, more precisely, the lack therein of interest in and frequently opportunities for the assimilation of promising developments is today becoming the tightest bottleneck in the way of the penetration of production practice by what is new. If an industrial requirement emerges in society, this moves science forward more than a dozen universities, F. Engels wrote. We now frequently encounter a situation where this obvious proposition does not work.

I will give a typical example. The new ideas and solutions found during the designing of back-beam research accelerators hinted to scientists of the USSR Academy of Sciences Siberian Department Nuclear Physics Institute at the possibility of creating small efficient installations for industrial purposes. With sufficiently strong planning-design and production facilities the institute not only provided for the development of the production forms and records and the manufacture of various small-series accelerators but also accommodated approximately 70 installations in various sectors of industry. Their use is ensuring the increased strength of cable insulation, the heat resistance of polyethylene pipes and the extermination of granary pests. The overall savings from the application of the accelerators at enterprises of the Ministry of Electrical Equipment Industry alone is approximately R100 million.

Thus everything is to hand for the extensive introduction of these promising installations: the production forms and records, engineering experience, personnel who can contribute in skilled manner to industry's assimilation of the accelerators, sales markets inside the country and abroad are ensured and development is under way guaranteeing replacement of the installations in the future. Nonetheless, for many months matters were at a standstill. Only last year, given the active support of the Novosibirsk Obkom, did the Ministry of Electrical Equipment Industry adopt a decision on the joint work of two production associations of Novosibirsk and the Nuclear Physics Institute on organization of the series manufacture of the accelerators.

In order to overcome the difficulties attending the existing practice of introduction it is essential, we believe, to adjust the system of planning of the material production sphere. And primarily to determine permissible time periods for the use of each technique and the manufacture of its type of product. The material stimulation of the enterprise workers should be the maximum in the first period of work in accordance with new techniques and zero or negative even after the expiration of the determined time period of the "life" of a technique. The level of technology and products should be appraised by an extradepartmental body with obligatory regard for export potential. At the same time it is essential to create for production practicable opportunities for replacement. In planning it should be left reserves of capacity for modernization and the assimilation of what is new. The enterprises should have more opportunities for the creation of pilot-industrial installations and experimental

shops, for which is currently provided less than 1 percent of capital investment in basic production. Practice shows that without such an improvement of planning we will not be able to make full use in production of the advantages of our system of management.

An exceptionally important role in science's relations with production is performed by direct ties to specific enterprises.

Our department's cooperation with the Novosibirsk Aviation Plant imeni V.I. Chkalov and the "Sibelektroterm" and "Sibsel'mash" production associations may serve as examples of such mutual relations. The blast-aided hydrodynamic stamping of products proposed by the institute's scientists was introduced for the first time in the country at the Plant imeni Chkalov, whence it has spread to other plants of the sector. Treatment of materials by slow application stress during preheating (under superplasticity conditions) has followed the same route.

The collaboration of academic science and industry is now also being developed efficiently in other cities of Siberia where scientific centers of the department are located--Tomsk, Krasnoyarsk, Irkutsk and Yakutsk. An exceptionally important part in this work is being played by the active position of the obkoms and kraykoms.

Unfortunately, within the framework of the department's evolved and successfully developing collaboration with ministries and departments it has as yet only been possible to solve mainly the problems in which the sector itself has a vital interest. In respect, however, of work of an intersectorial nature the ministries are not usually rushing to display initiative. The need for the further development of the academic institutes' own design and experimental-production facilities is revealed most sharply in such situations. The above-mentioned story concerning the accelerators could serve as a good illustration here. A big role in surmounting departmental disconnection in certain of the most important areas is performed by the USSR State Committee for Science and Technology, by way of the realization of goal-oriented comprehensive programs included. The solution of major all-union problems might also be accelerated with the assistance of the creation under the aegis of the State Committee for Science and Technology and the USSR Academy of Sciences of intersectorial scientific-technical associations.

Our "introduction belt"--the system of sectorial institutes and design bureaus concentrated around the Novosibirsk scientific center of the USSR Academy of Sciences Siberian Department and designed to accelerate the passage of scientific developments into the national economy--also manifestly lacks an intersectorial orientation. They could enlist skilled specialists and take advantage of the scientific developments of the department's institutes, thanks to which a ministry assimilates technical and engineering innovations in a very short time. The total savings from the developments of the subdivisions incorporated in the "introduction belt" has amounted in the time of its existence to over R250 million. At the same time, however, in certain special design bureaus the research which represents a development of the scientific process stock of the academic institutes constitutes only a small part, and it is mainly loaded with ministries' current assignments. But if this is the case, their location in

the zone of the Novosibirsk academic community is entirely unwarranted. It would be more expedient to transfer them to the Siberian Department or put them under the direct jurisdiction of the USSR State Committee for Science and Technology.

Continuing the policy of the 26th party congress, the CPSU Central Committee November (1982) Plenum once again emphasized the exceptional significance of the problem of intensification of the national economy and demanded the revelation and removal of the concrete difficulties impeding scientific-technical progress. The country expects of the scientists new fundamental results in all branches of science and more active influence on an increase in social labor productivity, and the scientists are clearly aware of the entire extent of the responsibility to society. But it is essential to approach the goal from two sides. The scientists must intensively and responsibly raise their developments to the level at which they may be accepted by industry. But it is even more important that industry also have a vital interest in the work of the scientists.

8850
CSO: 1814/69

GREATER INCENTIVE FOR TECHNOLOGY PIONEERS URGED

Moscow PRAVDA in Russian 19 Jan 83 p 3

[Article by Docent Ye. Artem'yev, candidate of technical sciences: "Agreeing To No Less"]

> [Text] How to achieve a position where our machinery, instruments and equipment are not inferior in technical level to the world's best? The CPSU Central Committee November (1982) Plenum noted the need to reveal and remove the difficulties impeding scientific-technical progress. Planning methods and the material incentive system must, the plenum said, contribute to the combination of science and production. It is necessary to ensure that those boldly going ahead with the introduction of new equipment not find themselves in a disadvantageous position. The task is clear, and it must be accomplished.

The technical-economic level of any product takes shape in the course of its development. If designers have set themselves the goal of surpassing the indicators of the best models, their path to this begins with the patent search. It then becomes clear what in world technology may be considered a stage that has already been passed, what ideas it is desirable to adopt and which problems require original technical solutions.

Whence it is clear that the technical-economic level of products being created may be controlled. However, there can be no success here without a definite system of measures obligatory for all developers.

An effective lever of a rise in the level of technology is invention as a form of the technical embodiment of progressive scientific ideas. It is increasingly acquiring an organized, planned nature. In our day the overwhelming majority of inventions is born in the course of R&D. Like standardization, which is used as a means of product quality control, invention should better serve as an instrument of a rise in the level of technology and the world patent collection, particularly patent documents of current registration, as the standard for checking the level of completed developments. Conformity with the best world and national models--we cannot and must not agree to anything less--this was how the task was formulated at the 26th CPSU Congress. But it is not yet being tackled quickly enough.

Although the number of registered inventions is growing continuously, the level of the so-called new technology remains insufficiently high. The following have been created in recent years, for example: an automated press which is inferior to operating presses in weight, size, capacity and productivity; a high-voltage circuit breaker which is considerably heavier than an analogous foreign model; and a corn-harvesting combine with low maneuverability and of complex design. At the same time genuinely progressive equipment using efficient inventions is sometimes assimilated too slowly. This holds back the patenting of Soviet inventions abroad and the sale of licenses therefor.

A reason is that the forms of control of invention, patent-licensing work and the creation and assimilation of technology do not yet correspond in all respects to the rate of scientific-technical progress. Until recently separate plans were established for the creation and introduction of inventions, the development and assimilation of new technology and patent-licensing transactions. Yet all these are interconnected links of a single chain. For can there really be new technology if it does not use a single significant invention imparting higher properties to it? Economic stimulation and material incentive funds and even the organizational-legal regulation of these forms of activity were also formed independently of one another and failed to prompt the speedy assimilation of new products based on highly efficient scientific-technical achievements. The criteria of an evaluation of developments' scientific-technical level, expert appraisals of inventions and certification of the quality of industrial products are insufficiently precise.

Of course, technology is being perfected and international scientific-technical cooperation is developing. The exchange of scientific-technical achievements is also growing, and the scale of patent-licensing transactions is increasing.

However, the results that have been achieved are below the potential of national science, technology and production. They are inferior to analogous indicators of a number of other industrially developed countries. The fact that not enough attention is paid to the legal protection abroad of national scientific-technical achievements and export items is also reflected.

These shortcomings must be removed. The creation in the country of an efficient system of controlling the technical level could play an important part here, I believe. The standards here could be, as already said, the latest patent documentation and the most accomplished inventions created in the development process. The system should incorporate a set of organizational and legal measures aimed at the establishment, support and maintenance of the required scientific-technical level of the new technology being created and providing for a purposeful impact on the relations of the collectives and persons participating in the work thereon. Of course, the system will be beneficial if it encompasses all stages of the creation and assimilation of new technology and simultaneously actively influences an increase in the quality of industrial products and their competitiveness on world markets.

How do we conceive of the proposed system? Its basis is precisely organized information on the scientific-technical level of developments. In publishing information on foreign inventions our state familiarizes specialists with the

demands made on the level of technology in other countries. Patent and business-economic information is a kind of compass in scientists' and developers' work. Whence the need to develop and perfect it and increase the promptitude of reports on inventions of current registration. A "packet" of instructional-procedural documents determining the procedure of data research at the basic stages of scientific research and experimental-design work is essential also.

Another important element is planning the level of technology. It is necessary at this stage to determine the basic indicators which have to be reached and the measures and material-financial and labor resources essential for this. A big role could be performed here by the classification of developments by category. A system of summary, comprehensive and individual indicators which is differentiated and interconnected by "stage" of control, sector and type of technology is needed for this. With the help of the summary indicators quotas may be determined for organizations for an increase in the proportion of developments of the highest category, savings from invention, efficiency of technical creativity and others. The comprehensive and individual indicators will help substantiate concrete targets for the achievement of the required technical-economic specifications and a rise in the level of technology by way of development of new and the use of existing inventions.

Interconnected material and moral incentive and liability measures at all stages of the development and assimilation of new technology should be an indispensable part of the system. It is a question, for example, of preferential financing and the extension of credit, increased profits for the pioneer collectives with the aid of a flexible price-forming system, the transfer of technical experience on a business contract basis within the country and on the basis of licensing agreements abroad and of the creation of bigger incentive funds. The main source of their replenishment could be deductions from incentive surcharges to the wholesale price for the quality of new technology.

The most complex task is securing privileged conditions for the organizations developing and assimilating fundamentally new technology with the use of important inventions. It is perfectly obvious, for example, that different stimulation is needed for organizations which create major technical innovations and assume the risk of their first use and, on the other hand, collectives which borrow technology which has already been officially approved. It is clear that it is necessary to materially encourage both, but differently. Why not introduce new forms of protecting the rights of developer-organizations, including enterprises, which have performed the most capacious work on the experimental industrial assimilation of scientific-technical solutions embodied in inventions upon the series production of a new product?

And, of course, an efficiently operating procedure of the evaluation of the technical-economic level of products being designed and manufactured with the use of extradepartmental expert appraisal is needed. The objective findings of experts not limited by a sectorial "framework" on the scientific-technical level of a completed development would be its pass into practice confirming the expediency of capital expenditure on experimental industrial assimilation and the sale of a license.

The CPSU Central Committee and USSR Council of Ministers decree on a streamlining of the economic mechanism makes it incumbent on the USSR State Committee for Science and Technology to determine the procedure and specific times of extradepartmental expert appraisal of the technical-economic indicators of particularly important types of product being created and production process at the stage of industrial assignments and end results. Thus the basis of a uniform procedure of the evaluation of the developments being undertaken and, consequently, of the technical-economic level of a new product takes shape.

8850
CSO: 1814/67

28TH MEETING OF CEMA COMMITTEE FOR SCIENTIFIC, TECHNICAL COOPERATION HELD IN HAVANA

Moscow APN DAILY REVIEW in English 17 Mar 83 pp 1-3

(Article entitled: "Course--Technical Progress")

[Text] The 28th meeting of the CEMA Committee for Scientific and Technical Cooperation has ended in Havana. Following is the interview which a TASS correspondent was granted by Academician G. I. Marchuk, Deputy Chairman of the USSR Council of Ministers and Chairman of the USSR STate Committee for Science and Technology, who presided at the meeting.

Question: What are the main results of the meeting?

Answer: It was a great success. We organised mutual consultations and an exchange of the experience of forecasting and planning in science and technology. The heads of all delegations stressed that the generalised knowledge of methods and other matters relating to the preparation of five-year and long-term plans of scientific and technical progress can and should facilitate shaping harmonised programmes of cooperation for the promotion of scientific and technical progress in the CEMA countries. In this connection the CEMA International Research Institute of Management was instructed with generalising materials relating to forecasting scientific and technical progress and with formulating proposals for the future.

I would also emphasize the problems connected with the saving of fuel and energy resources, including secondary resources. All CEMA countries are doing a great deal of work towards this end. However, to promote the interests of all CEMA countries it is necessary to work out a common policy in this field. We reached an agreement on the more thrifty and rational use of fuel, energy crude products and materials and backed it by the corresponding decision.

Within the framework of the drive for the greatest possible economization of materialised and live labour, the meeting examined the further improvement of cooperation in the faster development and introduction of more effective and efficient methods, machinery and materials.

The meeting discussed proposals to develop intra-CEMA cooperation in creating all the conditions necessary for the accelerated and extensive introduction of automated systems and also proposals connected with the development of industrial robots and their components. The meeting specified a collaborative programme, covering the period until 1990, for the development and large-scale application of micro-processors in the CEMA countries.

Participants in the meeting also reviewed progress in the implementation of the general agreement on the cooperation of CEMA countries in fulfilling the plan, scheduled until 1990, for the faster development of science and technology in Cuba.

The heads of the delegations of the USSR, Bulgaria, Vietnam and Cuba signed a protocol to form a Havana-based international scientific team to tackle the major problem of corrosion and tropicalisation. The protocol illustrates joint efforts aimed to promote Cuba's deeper involvement in socialist economic integration.

Question: What can you say about the prospects of Soviet-Cuban scientific and technical cooperation?

Answer: When we were in Cuba, a satellite-assisted Havana-Moscow communication link went into service. It connected the computing centres of the Institute of Scientific Information of the Cuban Academy of Sciences and the CEMA International Centre of Scientific and Technical Information situated in the Soviet capital. This information bridge, running across space, has considerably increased possibilities for the rapid exchange of important materials and data. This is a new vivid confirmation of Soviet-Cuban fruitful scientific and technical cooperation which continues to grow in depth.

In Havana I had a pleasant mission to discharge and to present the diploma of a foreign member of the USSR Academy of Sciences to Wilfredo Torres, President of the Academy of Sciences of Cuba. We conducted talks and signed a protocol registering progress in the development of scientific and technical cooperation between the Soviet Union and Cuba. The protocol specified many major aspects of the mutual commitments stemming from the CEMA general agreement mentioned above and from the Soviet-Cuban bilateral agreement signed in February 1981.

A few figures to characterise the state and prospects of stable and fruitful Soviet-Cuban relations in this field. This year the foreign trade agencies of the two countries will coordinate and sign contracts covering over 30 per cent of the deliveries of equipment, instruments and materials of 2,500 types which Cuba will receive from us at the expense of an easy-term Soviet credit. The credit was given to develop scientific facilities in Cuba. A third of the credit will be used to organise research in the peaceful uses of atomic energy, develop new biotechnology to receive

electricity and livestock fodder from local timber, agricultural and other waste, and to mount many other major basic and applied projects. I want to stress that 28 Soviet ministries and government departments will participate in projects covering half of the 850 themes chosen for research.

(Sotsialisticheskaya Industriya, March 17. In full.)

CSO: 1812/104

OLD STRUCTURAL GUIDELINES IMPEDING PROGRESS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Feb 83 p 2

[Article by N. Onipko, member of the USSR State Committee for Science and Technology Scientific Council Commission for Legal Problems of Management: "The Sectorial Headquarters: Extent of Responsbility"]

[Text] Here, unfortunately, is a typical situation. Approximately 40 associations and enterprises of the USSR Ministry of Power and Electrification were systematically disrupting supplies of metal structures and precast ferroconcrete for a complex of the Atommash nearing completion. They thereby also disrupted the specified commissioning times of approximately 200 units of production equipment.

As is usual in such cases, there are a multitude of reasons. But it is clear to everyone that the list of these reasons may only be extended beyond the framework of the union Ministry of Power and Electrification with very great effort. I therefore inquired: which of the ministry's leaders bore personal responsibility? None, it turned out. Somewhere, at the lower managerial levels, someone had been reproved. But the main thing here does not change: no single leader of a sectorial headquarters is really responsible for supplying a most important construction project. Consequently, the roots go back to organizational matters.

In order to correctly coordinate the solution of big state questions the ministry must prudently organize the activity primarily of its own machinery. And this is being done successfully, for example, in such sectors as agricultural engineering and shipbuilding and electrical engineering industry. Measures enhancing the efficiency of management are being implemented in many ministries of the Ukraine, Latvia and Estonia.

Accumulated experience shows that the leaders of these ministries first of all ascertain with what new tasks life has confronted them, and draw the conclusions from this, and what changes need to be made to ministry structure. Having specified the duties of the renewed subdivisions, they also grant them the necessary rights. Particular attention in each case is paid to the concretization of personal responsiblity and increased performance discipline. The size of the administrative-managerial machinery and expenditure on maintaining it are cut considerably.

But, as we know, the following also happens: toward the end of the year a ministry reduces the number of administrators, but one looks again a month or two later, and there are even more of them. In order to put an end to these inflows and outflows the rational organization of management is enshrined in a special document--the regulations governing the ministry. It is this which, producing a system, sums up everything that has been found for an improvement in leadership.

But this is what an analysis shows. By the start of the current year of the 94 all-union, union-republic and republic ministries inspected, only 17 had renewed their regulations since March 1973, when the formation of the two- and three-tier industrial management system began. In the remaining sectorial headquarters, consequently, it is not the forms of management which are being brought into line with the changing economic tasks but, on the contrary, the developing organism of the economy is being adapted to the settled managerial forms. But, however hard one may try, one will not succeed in squeezing into the old all the functions which are becoming predominant in the activity of an economic body.

Let us take the construction materials industry, where to this day even it is guided at the union level by regulations governing the ministry which are now 15 years old. It is explained in the sectorial headquarters: they cannot establish new regulations if there is as yet no master outline of management of the sector--it has been submitted to the USSR Gosplan three times, but they have not agreed.

As if the question had really been held up owing to factors beyond the ministry's control. But it was worth digging a little deeper, and it was thereupon ascertained that the sectorial headquarters itself had labored substantially to impede matters. Litigation has been under way for a long time between the union ministry and the RSFSR Ministry of Construction Materials Industry: the first is attempting to take away from the second enterprises with the best degree of technical equipment. In particular, those which produce industrial glass, ceramic products, industrial sanitary engineering and other costly products. But inasmuch as a master outline of the republic ministry has already been approved, the union ministry's proposed revision is not being accommodated. And this case has been sent to arbitration.

Detailed explanations as to why management is not being streamlined quickly enough are given in other ministries also. Some are impeded by the disconnection of sectorial (by normative net product) and territorial (by "gross") planning. Others by the incomplete work of the USSR Central Statistical Administration in the sphere of accounting, accountability and data processing. Yet others by the imprecision of the directives of the USSR State Committee for Labor and Social Problems with respect to stimulating the machinery workers.... True, all this is making an improvement in leadership more difficult. But it is also true that the sectorial headquarters themselves are making far too little effort to remove the difficulties. The justice of this assertion is best proven by the fact that 17 ministries, under exactly the same conditions, have brought the work to a logical conclusion.

The ministries in which there has been no plan to improve the activity of the machinery at all are comparatively few. In particular, the Ministry of Power Machine Building evidently had too narrow a concept of the tasks ensuing from the party and government decree on a refinement of the economic mechanism and is as yet reducing everything to a regulation of the system of indicators. And it is not fortuitous that T. Filippov, chief of the planning-economic administration, appears in the order as the person responsible for realization of these decisions. But the economic mechanism sets people in motion. But who will improve their interaction?

One asks oneself this question when one is acquainted with the work of the ministries where something is being done in this direction: they are revising the functions of the subdivisions, improving accountability, increasing the promptness of the circulation of material and so forth. This is how matters stand in the Ministry of Chemical and Petroleum Machine Building, for example. Here also the planning-economic administration is responsible for fulfillment of the order concerning a streamlining of the economic mechanism. But at the same time, in their official capacity, also V. Potapov, chief of the legal department, Business Manager V. Bessonov and D. Bodrov, leader of the ministry inspectorate. However, precisely because there are so many offices the rationalization of managerial work is not concentrated in any of them. And this being the case, there is neither an anlysis thereof nor consistent development.

There is also an infelicitous state in certain ministries in supervision of an improvement in the work of the managerial machinery. The fulfillment of measures is frequently checked out merely by technical workers. The sectorial headquarters where the question of the style and methods of leadership have been examined by the board may be counted on the fingers of one hand. And as a system this is entirely lacking in practice for checking out the same at the enterprises under their jurisdiction. A questionnaire in 10 ministries showed that when visiting an enterprise or association, the inspectors concerned themselves with all current issues, except one--how to ensure that "routine" not swallow up the administrators.

The CPSU Central Committee November (1982) Plenum decree clearly records: "An Increase in Every Possible Way in the Level of Work on a Further Improvement in Planning and Management of the Economy and a Refinement of the Style and Methods of Management To Be Considered a Most Important Task". But, as it turns out, the ministries do not today have an office which could study and propose such solutions.

8850
CSO: 1814/68

WORKS ACCEPTED FOR GOVERNMENT PRIZE COMPETITION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Dec 82 p 2

[Text] The USSR Council of Ministers' Prizes Commission announces that the following works have been accepted for participation in competition for USSR Council of Ministers' prizes for 1983:

1. "Intensification of Industrial High-Pressure Polyethylene Works by Way of Their Retooling"--N.B. Babayev, V.V. Bystrov, G.I. Vasyutin, F.I. Duntov, T.P. Miyin, N.A. Kokhanchik, L.V. Novozhilov, I.I. Novikov, A.I. Sinitsyn, N.P. Tismenetskiy, N.Ya. Tumarkin, M.S. Chechik, Yu.A. Shelinger, P.Ye. Borulenko, N.I. Vostrikov, N.G. Gavrikov, R.A. Zatretginov, A.P. Zagummenov, V.I. Ivanov, V.N. Monastyrskiy, F.V. Oktyabr'skiy, B.N. Pozdnyakov, L.Sh. Shimanovich, R.I. Epshteyn, Ye.M. Filippov.

Submitted by the Ministry of Chemical Industry.

2. "Composite Scientific Research on the Creation and Introduction of the Highly Efficient 'Plastobit-2M' Insulation Coating and the Techniques of Applying it on Trunk Pipelines to Protect Them Against Soil Corrosion"--S.R. Rafikov, Sh.N. Akhatov, V.G. Bushkov, F.Ye. Vasil'yev, A.G. Gumerov, A.G. Derechinskiy, Ye.V. Kalabugina, G.Sh. Kudoyarov, A.S. Kumylganov, A.A. Mayskiy, V.V. Osipov, Ye.M. Pavlov, M.K. Rameyev, A.M. Tkach, L.D. Churilov, D.M. Shavaleyev, A.Kh. Amirkhanov, V.G. Ben'kovskiy, F.B. Gimalova, V.G. Gutsalyuk, A.Ya. Svetov, V.L. Berezin, V.I. Ionov, A.V. Chekin.

Submitted by the Ministry of Petroleum Industry.

3. "Industrial Development and Introduction of Efficient New Zeolite-Containing Catalysts of the Hydrogenated Refining and Enrichment of Motor Fuels"--A.V. Agafonov, R.R. Aliyev, V.M. Vdovin, V.Ye. Vlasenko, L.E. Gel'ms, N.V. Goncharova, M.A. Kaliko, A.A. Kamenskiy, L.T. Kozlov, V.M. Kurganov, V.A. Malafeyev, A.G. Manetov, B.K. Nefedov, L.N. Osipov, S.G. Prokopyuk, S.P. Rogov, N.G. Silin, L.P. Tarelkin, L.V. Turovskaya, V.A. Khavkin, Yu.V. Shevelev.

Submitted by the USSR Ministry of Petroleum Refining and Petrochemical Industry.

4. "Creation and Extensive Introduction in Petroleum Refining and Petrochemical Industry of Progressive Techniques and Highly Productive Equipment for the

Thorough Removal of Corrosive Salts Which Appear in Petroleum Refining"--D.N. Levchenko, Ya.I. Pinkovskiy, L.A. Bychkov, R.A. Aliyev, L.Ye. Zlotnikov, V.A. Ryabov, N.V. Bergshteyn, V.I. Karzhev, N.M. Nikolayeva, Ye.D. Radchenko, V.I. Volyanyuk, V.V. Napadovskiy, A.V. Kondrashov, P.S. Deyneko, E.S. Rybakov, Yu.I. Sych, Ye.K. Platonov, M.S. Romashkevich, S.S. Bokarev, A.V. Gribanov, S.M. Mel'nikov, V.I. Klimenko, S.S. Lupeyev, A.G. Luppa, S.Z. Umalatova.

Submitted by the USSR Ministry of Petroleum Refining and Petrochemical Industry.

5. "Scientific-Technical Development and Introduction in the National Economy of Highly Efficient Metal Corrosion Inhibitors"--L.I. Antropov, Ya.B. Kozlikovskiy, V.M. Ledovskikh, S.A. Nesterenko, I.S. Pogrebova, E.A. Ponomareva, A.G. Vorob'yev, M.V. Uzlyuk, Yu.V. Fedorov, A.S. Afanas'yev, R.A. Yeremeyeva, S.G. Tyr, Yu.I. Babey, A.K. Mindyuk, S.N. Baranov, Yu.G. Skrypnik, A.L. Korsunskaya, S.P. Miskidzh'yan, V.V. Paustovskaya, Yu.G. Pisarev, G.A. Markus, P.A. Vlasov, V.G. Ovchinnikov, V.N. Umutbayev, V.F. Krivosheyev.

Submitted by the USSR Ministry of Higher and Secondary Specialized Education.

6. "Research, Development and Introduction in Industry of Highly Efficient Mass Exchange Vibrating Columns"--T.V. Baskakova, A.A. Vasin, V.B. Volkova, I.Ya. Gorodetskiy, A.Ye. Kostanyan, L.A. Legochkina, P.A. Lupanov, V.M. Olevskiy, B.S. Smolyanskiy, V.A. Tat'yanchikov, E.S. Tikhonovich, L.N. Chernysheva, L.S. Blokh, V.I. Val's, S.M. Merman, Z.Ya. Kervalishvili, G.A. Pagava, G.I. Kovalenko, N.P. Fisenko, V.M. Lebedev, B.I. Lur'ye, V.I. Kandela.

Submitted by the Ministry for Mineral Fertilizer Production.

7. "Industrial Introduction of Acetic Acid Production"--G.S. Bilko, B.M. Blokh, A.V. Vasilenko, V.I. Gogotov, V.T. Zagorul'kin, V.V. Kapelyukh, N.I. Kostyukov, V.V. Kotov, L.A. Kucherneko, B.N. Lishchina, A.I. Red'ka, A.V. Serdyuk, V.D. Stovpyaga, M.A. Syrovatskiy, V.P. Travko, K.V. Shchukin, P.P. Borisov, I.D. Zotov, D.V. Melent'yev, M.D. Pukish, S.M. Stefan, G.T. Gazaryan, Kh-M.A. Brikenshteyn, A.L. Lapidus.

Submitted by the Ministry for Mineral Fertilizer Production.

8. "Development of Designs and New Techniques of the Comprehensively Mechanized Production of the Standardized Highly Productive "SP87P" and "SP202" Basic Flight Conveyors of Increased Reliability and Working Life for Retooling the Coal Mines"--A.Ya. Abuzarov, B.A. Alekseyenko, N.P. Babenko, N.P. Batrakov, S.A. Vakhalin, V.I. Galkin, Yu.D. Gorokhov, I.M. Gutyy, Yu.I. Degtyarev, A.D. Ignat'yev, A.Ye. Il'in, A.K. Il'in, I.V. Kuznetsova, I.P. Levchenko, V.G. Linitskiy, S.A. Logachev, V.D. Perskiy, I.B. Rabinovich, A.D. Sergeyev, L.S. Slonim, I.S. Solopiy, V.V. Turkin, V.N. Khorin, S.A. Tsil'ker, B.A. Eyderman.

Submitted by the USSR Ministry of Coal Industry.

9. "Increase in the Geological-Economic Efficiency of Seismic Prospecting for Oil and Gas While Ensuring Work Safety and Preservation of the Environment on the Basis of the Creation and Extensive Industrial Introduction of Surface

Nonexplosive Gas Dynamic Elastic Vibration Sources"--G.G. Buzo, B.G. Vanshel'boym, A.D. Krasnopol'skiy, V.I. Korobov, V.V. Mayorov, A.K. Urupov, V.A. Shevelev, M.B. Shneyerson, B.D. Yermakov, I.V. Ivanova, V.P. Chervonobab, M.M. Mansurov, S.F. Khaysanov, A.A. Shevchenko, A.G. Asan-Dzhalalov, A.I. Bugayets, N.I. Davidenko, V.A. Panteleyev, F.Kh. Safin, A.I. Svinin, E.P. Khalabuda, A.S. Shaginyan, V.V. Yemel'yanov, A.A. Gyul'nazaryan, A.P. Miroshnikov.

Submitted by the USSR Ministry of Geology.

10. "Complex of Scientific Research and Planning-Design Work on the Creation and Introduction of New Methods and Means of Combating Dust Providing for a Considerable Reduction in Miners' Pneumoconiosis in Coal Mines of the Country's Eastern Regions"--I.P. Belonogov, A.D. Bondarenko, M.D. Braginskiy, V.V. Vil'chitskiy, L.I. Gapanovich, N.A. Drizhd, V.S. Yevseyev, V.N. Ivanov, I.A. Ivlev, I.G. Ishchuk, Ye.I. Kiselev, V.N. Kolosov, V.V. Krivykh, G.V. Lapshin, I.G. Legkodukh, L.Ya. Likhachev, L.A. Mikhits, Ye.I. Ontin, G.A. Pozdnyakov, L.I. Ryzhikh, V.V. Semenov, A.V. Trubitsyn, N.I. Yakovlev, A.F. Belousov, Sh.T. Tokmagambetov.

Submitted by the USSR Ministry of Coal Industry.

11. "Development, Creation and Extensive Introduction in Production of Roentgenoradiometric Methods and Apparatus Providing a Considerable Increase in the Efficiency and a Fundamental Improvement in the Techniques of Geological Prospecting for Solid Minerals"--G.D. Balakshin, P.M. Vol'fshteyn, K.I. Voyakovskiy, S.M. Gol'dman, B.S. Grigorkin, V.A. Yerkhov, V.I. Zgardovskiy, V.I. Kolesnikov, Yu.Ya. Kopytov, G.S. Kritsuk, G.V. Ostroumov, A.P. Ochkur, S.M. Przhiyalgovskiy, B.P. Pytlyak, S.I. Savosin, V.N. Starovoytov, A.N. Sukhno, I.V. Tomskiy, V.S. Shibkov, S.L. Yakubovich, Yu.P. Yanshevskiy, V.P. Varvaritsa, V.A. Meyer, V.V. Smirnov.

Submitted by the USSR Ministry of Geology.

12. "Creation and Introduction in Mining Industry of Piling Under the Difficult Orographic and Glacioclimatic Conditions of the Kola North and Siberia"--N.A. Voronkov, V.V. Gushchin, G.M. Yeremin, G.V. Kalabin, E.G. Krasnosel'skiy, B.K. Ovodenko, I.A. Turchaninov, V.G. Kolesnikov, V.P. Vashchenko, Yu.V. Garmanov, V.A. Kaytmazov, V.S. Kozhin, A.A. Konovalov, V.Ya. Maymind, V.S. Mokhover, Ye.F. Saprykin, V.I. Timoshin, V.M. Al'tshuler.

Submitted by the USSR Academy of Sciences.

13. "Substantiation of the Optimum Directions of the Development of Progressive Technology and Techniques of the Dressing of Minerals and Their Introduction in the Ore-Treatment Sectors of USSR Industry"--B.N. Laskorin, L.A. Barskiy, G.D. Krasnov, V.A. Chanturiya, V.S. Vinogradov, V.V. Karpov, L.A. Mizernitskiy, P.Ye. Ostapenko, G.F. Suslikov, M.A. Belyayev, A.K. Gruzdeva, A.S. Petrov, I.S. Blagov, M.P. Gerasimenko, P.N. Ivanov, A.R. Molyavko, V.K. Panfilov, I.Ye. Cherevko, I.I. Devyashin, A.O. Kozhevnikov, A.D. Maslov, V.N. Shokhin, B.D. Orlov, V.A. Polotskiy.

Submitted by the USSR Academy of Sciences.

14. "Study of the Microbe Corrosion of Industrial Materials and Development of Measures to Prevent It"--Ye.I. Andreyuk, V.I. Bilay, V.V. Smirnov, I.A. Kozlova, E.Z. Koval', L.I. Rubenchik, L.M. Apininskaya, R.M. Kas'yan, V.I. Dakhnovskiy, V.V. Kiselev.

Submitted by the USSR Academy of Sciences.

15. "Study and Introduction of Apparatus of the A.I. Seppo System in the Practice of the Treatment of Patients With Collum Femoris Fractures by the Metalo-Osteosynthesis Method"--L.A. Gans, Ya.B. Mytus, A.I. Seppo, U.R. Truupyl'd, T.Kh. Ernits, E.V. Saa, E.O. Yurgenson, N.I. Brovchenko, A.Ye. Kossoy, B.M. Korchemkin, E.A. Vyaert.

Submitted by the Estonian SSR Council of Ministers.

16. "Creation, Development and Introduction in Production and Medical Practice of Medical Compress Textile Products"--V.N. Filatov, V.N. Bogachev, N.V. Vorontsova, V.S. Grigoryan, V.V. Kas'yanenko, Z.A. Kolesnikova, V.A. Krashennikova, L.N. Nikitina, A.V. Karalkin, G.D. Konstantinova, V.S. Savel'yev, L.Z. Vel'sher, K.M. Lakin, V.I. Pronin, V.A. Makarov, Yu.L. Rozanov, B.A. Volkov, L.P. Demochka, M.A. Zakharova, Ye.M. Petrova, N.A. Sarayev, I.P. Panenkova, A.N. Petrov, Z.A. Rusinya.

Submitted by the USSR Ministry of Light Industry.

17. "Set of Works on the Creation and Introduction in the National Economy of a Family of Automated Power Installations Based on Aviation Engines"--V.F. Abubakirov, I.I. Agayev, G.Ye. Bolgartsev, V.G. Kurchenko, V.V. Khorunzhin, A.F. Shkuta, A.G. Yugay, V.A. Boguslayev, V.L. Voronin, F.I. Ishchenko, V.A. Konstantinovskiy, N.A. Lukinykh, V.I. Omel'chenko, V.L. Starikov, N.V. Burtsev, V.N. Kolomatskiy, U.U. Mansurov, L.I. Ovsiy, V.P. Roslyakov, S.P. Chitipakhovyan, V.M. Aristov, D.S. Yermakovich, B.A. Sukhanov, O.V. Popovskiy, V.A. Shpilevoy.

Submitted by the Ministry of Gas Industry.

18. "Set of Research, Planning-Design and Production Engineering Works on the Creation and Introduction of Progressive Arc Welding Techniques and Equipment (the 'Styk' Complex) for the Retooling of Welding Production at the Time of Installation of Trunk Pipelines"--I.K. Pokhodnya, V.N. Golovko, V.Ya. Dubovetskiy, P.A. Kosenko, V.A. Kotov, A.N. Kutovoy, L.N. Orlov, V.Ye. Paton, V.K. Sirik, V.A. Titarenko, V.N. Shlepakov, N.A. Zhukov, A.A. Korytin, A.P. Ladyzhanskiy, A.L. Malinin, A.M. Mikhaylichenko, E.M. Nemchitsskiy, V.Ye. Peredel'skiy, V.S. Rotenfel'd, O.M. Serafin, M.R. Unigovskiy, M.Z. Sheynkin, Ya.I. Mikitin, F.I. Peretrukhin, V.A. Asafov.

Submitted by the Ministry of Construction of Petroleum and Gas Industry Enterprises.

19. "Creation of the 'Boris Butom' 100,000-Ton Deadweight Oil and Ore Carrier" --G.M. Arutyunyan, Ye.V. Bridan, Yu.P. Vasyutin, V.N. Vysheslavskiy, N.I. Kirpenko, Yu.L. Legostayev, A.A. Malyarchuk, M.M. Obraztsov, A.G. Popov, A.G. Prokudin, S.S. Ryabyy, N.P. Sazanov, A.B. Travinskiy, Ye.P. Fisak, V.G. Tsyganenko, V.G. Chigretskiy, V.K. Shaposhnikov, V.M. Shtumpf, V.I. Yakivchuk, A.I. Kruglyak, L.K. Dryshtyn, V.A. Meshcheryakov, L.A. Kochukov, G.V. Teterevyatnikov, A.F. Tsybenko.

Submitted by the Ministry of Ship-Building Industry.

20. "Development and Mass Introduction of a Highly Efficient Technique of the Machining of Beet-Cutting Knives Based on the Creation of a New Brand of Super-hard Material Tools and Equipment for the Purpose of Increasing the Technical-Economic Indicators of Sugar Beet Production"--A.D. Baglyuk, V.V. Yevdokimenko, V.P. Zakharchenko, Yu.N. Kolesnichenko, N.P. Komyshan, Ya.A. Kunkin, V.A. Lazhevskiy, A.F. Lyshenko, M.I. Pium, P.T. Shul'man, V.D. Yakimenko, G.G. Dobrovol'skiy, V.N. Boychenko, V.A. Bulda, N.V. Vasil'yev, A.Ye. Golovatyy, Ye.V. Litvinov, I.Z. Purik, K.F. Kozinets, B.G. Kolesnik, Z.N. Palamarchuk, G.S. Stepanov, Yu.V. Tovstenko, M.G. Kovalev, P.L. Satur.

Submitted by the USSR Academy of Sciences.

21. "Research, Development, Organization of the Production and Introduction in Industry of Pipe, Container and Apparatus Welded Joint Automated Ultrasonic Control Systems"--V.F. Baldakov, V.A. Litvinenko, V.A. Troitskiy, I.Ya. Shevchenko, V.A. Bobrov, A.M. Vasil'yev, S.M. Zholobov, M.Yu. Razdol'skiy, P.F. Serb, N.V. Khimchenko, V.T. Biryukov, V.S. Zagorul'ko, V.N. Neglyad, V.T. Bobrov, M.M. Garshtya, V.D. Koryachenko, V.N. Sosedov, V.A. Chegorinskiy, V.Ye. Belyy, I.N. Yermolov, Ye.Kh. Ripp, G.A. Krug, L.I. Kuz'mina, Yu.A. Zhmurkin, M.V. Rozina.

Submitted by the USSR Academy of Sciences.

22. "Development and Introduction of Scientific Principles of the Rating and Increased Strength of Power Equipment in Terms of Crack-Resistance Criteria"--F.G. Maksudov, F.A. Iskender-zade, V.D. Kuliyev, V.M. Mirsalimov, Ye.M. Morozov, G.P. Nikishkov, I.F. Obraztsov, N.A. Makhutov, K.V. Frolov, V.Z. Parton, Ye.Yu. Rivkin, O.A. Shatskaya, G.S. Vasil'chenko, A.A. Popov, A.A. Chizhik, M.D. Abramovich, A.F. Getman, V.G. Zelenskiy, Yu.L. Izrailev.

Submitted by the Azerbaijan SSR Council of Ministers.

23. "Creation of a 'Pyatidesyatiletiye SSSR'-Type Fish-Processing Facility and Organization of Their Series Construction and Commissioning"--G.F. Andreyev, G.V. Arakel'yan, S.A. Brandaus, V.G. Davydov, V.M. Kolesnikov, Yu.N. Kutkin, N.M. Luzhin, M.V. Makarov, Ye.A. Novikov, V.M. Pukhlov, P.V. Soluyanov, Yu.V. Ul'yashkov, Yu.B. Ushakov, M.B. Filimonov, V.S. Azarkin, V.Ye. Astakhov, E.V. Barkova, V.F. Bedeker, I.G. Borodiy, N.A. Luk'yanov, L.V. Nalinkin, N.M. Muravenko, N.I. Chulin, V.S. Shelepnyuk, Ya. L. Kamenev.

Submitted by the USSR Ministry of Fish Industry.

24. "Development, Creation and Introduction of a Passegner Car Transportation Comprehensive Transport System:--V.I. Belyakov, L.P. Golyas, S.P. Zaytsev, A.P. Kosachev, V.G. Sivyakov, A.S. Chelyukanov, Yu.M. Vrodlivets, S.L. Gamerov, F.G. Gokhman, P.L. Katsnel'son, B.M. Kernich, G.G. Muzalev, V.M. Nalivayko, V.T. Prudnikov, I.N. Pertsovskiy, A.F. Golub', V.A. Kolchin, L.A. Piontkovskiy, P.I. Smetkin, G.I. Chernov, S.D. Chubarov, V.S. Zbarashchenko, M.D. Korotkov, V.I. Petrov, S.P. Pisarev.

Submitted by the Ministry of Automative Industry.

25. "Complex of Scientific-Technical Developments on the Automation of Operating Machining Small-Scale Production Based on a Production Process ASU Using Computers and its Industrial Introduction in the National Economy"-- N.P. Galev, Yu.Ya. Zhuravel', V.G. Legeyda, V.V. Marishchuk, L.N. Marchenko, S.B. Matusevich, Yu.V. Patsovskiy, D.I. Brokhman, Yu.N. Zhukov, A.B. Pogodin, M.Kh. Blekherman, L.N. Grachev, V.I. Vorontsov, V.L. Dobroslavskiy, A.V. Zhuzin, G.V. Kazarinov, V.G. Zaborovskiy, B.N. Lebedev, G.P. Nekhoroshev, V.M. Sotnikov, G.N. Khudin, Yu.I. Spletukhov, M.B. Ignat'yev.

Submitted by the Ministry of Electrical Equipment Industry.

26. "Complex of Scientific-Technical Work on the Creation and Introduction of Switches With Continuous Roll Surface"--V.I. Abrosimov, S.V. Amelin, A.V. Vodyanov, V.P. Demidov, N.N. Yelsakov, V.P. Komardinkin, A.V. Kuz'mina, G.V. Mel'kov, Yu.N. Petrov, N.N. Putrya, V.N. Rabotskiy, Yu.N. Radygin, A.M. Teytel', L.N. Frolov, A.G. Tsarenko, L.A. Shchetinin.

Submitted by the Ministry of Railways.

27. "Development and Introduction of a Set of Organizational-Technical and Economic Measures for the Formation of a Container Transport System of the Country"--S.S. Ushakov, V.A. Abgaforov, V.Ye. Biryukov, A.M. Obermeyster, M.D. Sitnik, A.M. Sobolev, D.A. Glebov, A.T. Deribas, V.Ya. Zherzdev, L.A. Kogan, N.R. Sinegin, I.A. Grabarnik, V.I. Zagorodnev, O.D. Raninkin, E.I. Staver, B.A. Yegorov, L.F. Morozov, F.P. Sagizly, I.I. Batishchev, V.G. Kartsev, E.A. Merkulova, M.A. Simyagin, V.Ya. Tayurskiy.

Submitted by the USSR Gosplan.

28. "Development of the Scientific Principles and Creation of a Set of Automatic Instruments and Metrological Support for Measuring Gas Moisture Content From Ultra-Small to Macro-Concentrations and Organization of Their Series Manufacture and Introduction in the National Economy"--Ye.G. Bazanov, A.N. Dryanov, V.Ye. Ivashchenko, A.F. Lysenko, S.G. Milovanov, Yu.N. Patrushev, I.A. Petrov, R.L. Pinkhusovich, G.Ye. Plaksin, K.V. Popov, L.Z. Savkun, V.Ya. Sidorov, M.D. Simulik, V.I. Smirnov, V.P. Sorokin, I.L. Chuprov, N.I. Gerasimov, Ye.A. Gershkovich, O.I. Gudkov, A.F. Zakharov, I.A. Sokov, A.N. Burov, V.S. Barkov, V.P. Kolomyytsev.

Submitted by the Ministry of Chemical Industry

29. "The Creation and Introduction in the National Economy of Electrophotographic Copiers and Seleniferous Electrophotographic Cylinders"--V.V. Branitskiy, Ya.F. Kalantayevskiy, Ye.Ye. Ledvanov, A.A. Mkrtichan, L.N. Perepechayev, A.S. Suleymanov, I.B. Shneydman, A.I. Kolosov, B.A. Tazenkov.

Submitted by the Ministry of Instrument Making, Means of Automation and Control Systems.

30. "Development, Assimilation of the Series Production and Introduction of a Set of Engineering Facilities for Saving Fuel-Energy Resources in the Sector and the National Economy"--Ye.P. Volkov, G.V. Bechin, V.A. Vasil'yev, E.I. Vertel', V.D. Gorokhov, A.A. Yegorkin, Yu.G. Yegorov, V.M. Yelagin, Z.A. Yefimova, V.N. Kovalev, N.D. Kolotilo, B.N. Kondakov, I.N. Krutov, V.V. Maruyeva, G.P. Morozov, B.V. Nikol'skiy, E.V. Petrosyan, L.I. Teplov, V.M. Tkachenko, N.Ye. Fomin, Yu.Ye. Sharygin, B.D. Shlyapnikov, A.K. Yakovlev.

Submitted by the Ministry of Electronics Industry.

31. "Development and Organization of the Series Production of Microprocessor Large-Scale Integrated Circuits for Broad-Use Microcomputers"--V.M. Vyglovskiy, V.N. Guminov, V.L. Dshkhunyan, S.A. Yeremin, Ye.I. Zhukov, T.N. Kovalevskaya, V.F. Kolesnikov, V.N. Litvak, Yu.A. Mukhin, A.D. Prosiy, G.V. Sonov, A.I. Stoyanov, V.D. Stepanov, A.P. Udovik, V.N. Kharin, V.S. Khoroshunov, V.S. Khorin, V.A. Khrustalev, L.P. Chaplygina, B.N. Chernukha, V.A. Shakhnov, V.A. Shiller.

Submitted by the Ministry of Electronics Industry.

32. "Complex of Work on the Creation and Assimilation of the Series Production of Vibration Apparatus and the Increased Vibration Reliability of AES and Thermal Power Station Turbo-Units"--N.A. Babadzhanyan, R.V. Vasil'yeva, B.Yu. Gutman, A.I. Ivanov, I.A. Kovalev, V.V. Malev, I.I. Orlov, V.A. Pakhomov, K.R. Tsekhanskiy, B.T. Runov, V.I. Petrovich, B.L. Golubtsov, Ye.A. Zverev, I.F. Zolotov, Ye.V. Sveshnikov, N.A. Bezus, L.Sh. Borodovskiy, A.P. Yermolayev, V.A. Klochko, V.V. Klyuyev, D.S. Kostrov, N.I. Nevmerzhitskiy, V.I. Rekunov, A.Ye. Manokhin, V.Ye. Shaternikov.

Submitted by the Ministry of Instrument Making, Means of Automation and Control Systems.

33. "Development, Organization of the Series Production and Introduction in Medical Practice of the 'Salyut' Polygraph and the 'MKh-01' Monitor and the Creation on the Basis Thereof of the 'Simfoniya,' 'Akis' and 'Sogda' Information-Computer Systems Designed for Data Processing During Intricate Reconstructive Cardiac, Pulmonary and Vascular Operations"--A.N. Vasil'yev, V.G. Bogunov, A.I. Volkov, V.S. Vygovskiy, A.P. Zubov, A.B. Illeritskiy, B.V. Kurochkin, V.I. Makaveyev, V.D. Mochalov, A.V. Nasedkin, V.I. Novikov, A.I. Proshlyakov, I.T. Rasskazov, A.S. Tikhonov, V.A. Tul'skiy, I.I. Kartashov, N.P. Chekannikov, A.A. Bunyatyan, I.N. Sablin, Ye.V. Flerov, Yu.N. Gavrikov, Ye.A. Dambrovskaya, V.M. Zaiko, B.A. Pavlov, V.P. Fominykh.

Submitted by the USSR Ministry of Health.

34. "Creation and Commissioning of Collective-Use Computer Centers Based on the Development of Scientific Principles of the Building of Collective-Use Data-Computer Systems and the Model Contractor Design of a Collective-Use Computer Center"--A.P. Aleshin, V.N. Kvasnitskiy, V.S. Makkaveyev, Yu.A. Mikheyev, O.V. Moskalev, A.L. Shchers, S.N. Bushev, N.I. Vadneva, I.B. Vinner, N.N. Yegorov, N.V. Kononov, V.L. Ponomarenko, A.A. Seregin, S.T. Utkina, V.M. Chizh, A.V. Shchukin, Yu.V. Metlyayev, L.B. Efros, A.A. Stogniy, Yu.A. Cherenkov, V.S. Nemtsev, N.I. Gerasov, O.M. Veynerov, R.V. Soms, F.I. Peregudov, N.S. Maksimov.

Submitted by the USSR State Committee for Science and Technology.

35. "Development of a System of the Industrial Creation and Introduction of Computer Software"--V.V. Amvrosenko, N.I. Vasil'yev, Ye.I. Veles'ko, Yu.M. Gorodetskiy, V.S. Kuznetsov, A.N. Kozulin, V.P. Kupriyanov, Yu.V. Lomin, S.M. Panina, L.M. Petrova, M.V. Petrova, A.Ye. Rozinkin, Yu.G. Sapronov, L.I. Sokolova, V.P. Tikhomirov, V.A. Yakovlev, L.K. Gorskiy, A.P. Duvakin, L.N. Il'in, V.B. Kozlovskiy, A.V. Kuzin, K.A. Melikyan, N.A. Saraf, A.S. Sogomonyan, V.P. Sukhanov, K.A. Tynson, V.M. Fal'yants, A.I. Yakunin, A.A. Azeyev, V.V. Penenko.

Submitted by the Ministry of Instrument Making, Means of Automation and Control Systems.

36. "Set of Common-Use Applied Program Batches for the Solution at Computer Complexes and on Computer Single System Machines of Engineering-Technical and Economico-Mathematical Balance-Sheet and Optimization Type Problems"--B.S. Berezkin-Orlov, A.A. Andreyev, A.A. Akhmetshin, A.V. Bogdanov, Yu.P. Galustyan, G.I. Gorbach, B.Ye. Demin, V.N. Dzekh, S.V. Yemel'yanov, V.N. Ignat'yev, D.N. Kiknadze, V.Yu. Kudrinskiy, S.V. Kupreyev, V.I. Maslov, I.M. Mel'nik, A.V. Nelinov, A.A. Petsko, V.Ye. Plish, N.S. Podgoretskaya, A.S. Stukalo, A.A. Tsvetkov, V.P. Tsvetkov, V.S. Mikhalevich, I.V. Sergiyenko, Ye.A. Drozhzhinov.

Submitted by the Ministry of Radio Industry.

37. "Study, Development and Introduction of Progressive Designs and Techniques of the Manufacture of Membrane Convection Heating Surfaces Large-Productivity Power-Generating Boilers"--V.V. Alekseyev, S.A. Babin, G.B. Bakanov, V.T. Bondarenko, L.N. Gaponenko, I.D. Golovkov, V.Z. Gurevich, A.M. Kopeliovich, G.I. Levchenko, Yu.N. Markin, V.K. Migay, A.A. Parshin, K.P. Petrenko, A.N. Pliguzov, V.V. Sedov, V.P. Stoyakin, A.V. Stoyanov, S.M. Ter-Minos'yan, V.P. Kharin, V.A. Shcherbatykh, V.I. Gorin, A.Yu. Ivanauskas, I.D. Liseykin, V.L. Kulzhinskiy, Yu.S. Yablochkin.

Submitted by the Ministry of Power Machine Building.

38. "Development and Creation of the Series Production of Sets of Apparatus for Potentiostatic Corrosion and Electrochemical Research"--Ya.M. Kolotyrkin, T.R. Agladze, L.G. Galkin, V.Ye. Kazakevich, E.V. Kasatkin, V.S. Kuzub, V.A. Makarov, V.G. Moysa, V.S. Novitskiy, V.F. Prokichev, A.N. Chemodanov, V.A. Shepelin, I.Ye. Bryksin, A.V. Ivans, A.A. Kalnberzin', P.P. Treys, E.A. Yakubaytis, Ya.N. Mudzhiri, P.T. Demchenko, G.I. Ginzburg, L.N. Gurok, A.F. Korasirov.

Submitted by the Ministry of Chemical Industry.

39. "Development, Organization of the Series Production and Introduction in the Coal Industry of Explosion-Protected Mobile Transformer Substations and Transformers With Capacity of up to 1 MV-A"--N.V. Baranetskiy, S.Ye. Bleykhman, I.A. Gorban', I.I. Grin', A.A. Gusev, V.M. Grushko, A.V. Yeremenko, B.P. Zernov, A.I. Kurbak, E.P. Mikhaylenko, A.I. Perkhomenko, A.I. Pletnev, A.B. Polonchuk, Ye.T. Stepanov, A.I. Khudokonenko, V.V. Shilov, A.L. Khat'ko, N.I. Voloshchenko, A.I. Grigor'yev, I.F. Sumin, A.M. Nosov, L.L. Vasil'yev, V.V. Senin.

Submitted by the Ministry of Electrical Equipment Industry.

40. "Creation, Assimilation, Introduction and Large-Series Production of a New BKZ-420-140 NGM-4-Type Supercharged Gas-Tight Boiler as Part of Newly Constructed Highly Efficient ZIGM TETs-Type Power Stations"--A.F. Gololobov, Yu.P. Zotov, V.V. Zubanov, A.A. Leytes, A.V. Nosov, N.V. Pavlov, A.V. Patrikeyev, A.A. Petukhova, V.G. Raspopov, V.S. Tonkoslez, V.N. Chirskoy, I.A. Shingel', A.I. Gol'berg, V.O. Maksvitat, Ya.P. Storozhuk, Yu.N. Shchipkov, M.A. Ploskovitov, A.P. Bersenev, Yu.P. Bulkin, V.S. Shchetkin.

Submitted by the Ministry of Power Machine Building.

41. "Development and Extensive Introudction of a System of Scientific-Technical Measures for the Transfer of Thermal Electric Power Stations to the Combined Generation of Thermal and Electric Power Providing for a Considerable Savings of Organic Fuel and Capital Investments in the National Economy"--V.A. Bonesko, Yu.A. Averbakh, A.V. Lyakin, M.M. Volynskiy, I.V. Gar'kavenko, I.G. Levit, M.L. Sheshelovskiy, B.V. Shumeyko, A.S. Naydenko, I.Ya. Kostenko, Yu.V. Yaroshenko, M.B. Gervits, L.N. Lipatnikov, V.P. Merezhko, V.K. Zaruba, M.A. Grabarnik, A.A. Karabin, V.P. Korytnikov, A.M. Sakharov, A.S. Zakharov, Yu.N. Nezhentsev, L.P. Safonov, V.A. Ivanov.

Submitted by the USSR Ministry of Power and Electrification.

42. "Development, Designing, Construction and Assimilation at the Bogdanovich Refactory Plant and Seversk Dolomite Works of the Continuous-Process Production of Efficient High-Temperature Fireproof Materials for Use in Thermal Units"--Yu.N. Arzanastseva, O.V. Bondar', A.N. Bykov, D.I. Gavrish, A.N. Gaodu, K.A. Zakaryan, P.G. Ivanov, G.I. Isayev, B.A. Kabachenko, G.I. Kuznetsov, V.F. Kutukov, V.S. Lyaptsev, N.V. Pitak, B.M. Poleshko, D.S. Rutman, V.G. Sivash, A.S. Tkachenko, V.S. Turchaninov, A.A. Shchipitsin, A.I. Vertov, A.P. Galushkin, V.I. Krys'kov.

Submitted by the USSR Ministry of Ferrous Metallurgy.

43. "Study, Development and Introduction of Highly Productive Industrial Techniques of High-Speed Pressing and the Creation of Equipment of Specialized Flow Lines and Shops for the Production of Pressed Sections from Aluminum Alloys for the Aviation Industry and Other Sectors of the National Economy"--R.V. Arutyunyan, M.F. Zakharov, V.Ya. Balashov, A.P. Borisov, V.I. Vasil'yev, V.G. Davydov, V.I. Yemenenkov, A.A. Kucher, Yu.N. Kon'kov, M.Ya. Korotkov,

P.A. Lukashuk, V.Ya. Meshkov, G.A. Malinovskaya, A.F. Ryzhov, G.N. Rakhinskiy, A.K. Svinarev, M.V. Fursov, V.Ye. Shtadel'man, I.A. Shur, V.P. Glagolev, Ya.L. Lumer, I.A. Rozhenko, V.S. Frolov, M.B. Ovodenko, P.L. Kravets.

Submitted by the Ministry of Aviation Industry.

44. "Study, Development and Introudction of a Set of Production Processes and Organization of the Industrial Manufacture of a Vast List of Sintered Materials Obtained by the Metallic Powder Rolling Method at the Vyksunskiy Order of Lenin Foundry"--G.A. Vinogradov, V.P. Katashinskiy, O.A. Katrus, V.F. Zdravkov, V.K. Kalenskiy, Ye.I. Astrov, A.N. Nikolayev, V.M. Shchekin, Yu.N. Zimitskiy, G.V. Shuvayev, A.S. Vavilin, N.V. Gureyev, S.F. Zhulin, O.V. Usankov, L.S. Shmelev, Zh.I. Dzneladze, R.P. Shchegoleva, A.V. Rogal'skiy, A.F. Silayev, V.A. Aleshin, G.I. Sazonova, V.Ya. Berent, N.A. Bushe, V.V. Bel'dey.

Submitted by the USSR Ministry of Ferrous Metallurgy.

45. "Development, Creation and Introduction of a Family of Mobile Holding Furnaces for the Transportation of Molten Pig Iron"--V.Ya. Adamenko, V.M. Arkusha, A.N. Vashchuk, N.V. Grushin, L.P. Zakov, B.S. Karasev, V.A. Kokorev, I.P. Korgun, V.I. Reshetov, A.I. Mayorov, N.I. Mironov, A.F. Nadtochenko, A.D. Fedotov, G.I. Yatsura, G.S. Korkishko, Yu.L. Naydenov, V.A. Organes'yants, N.A. Pupkov, P.P. Rodinov, A.B. Rakul'tsev, A.S. Shinkarenko, A.A. Yarkin, A.S. Yankovskiy.

Submitted by the Ministry of Heavy and Transport Machine Building.

46. "Creation and Assimilation of Self-Firing Electrodes of Modern High-Power Closed and Sealed Electric Furnaces"--N.F. Akhmetshin, V.T. Bobrov, B.F. Velichko, G.Ye. Goryaynov, V.T. Zubanov, N.K. Matyushenko, S.Ye. Pigasov, B.P. Safonov, G.V. Serov, N.V. Sidorenko, A.N. Popov, V.L. Rozenberg, L.A. Ryazantsev, E.M. Babenko, N.G. Vauchskaya, A.M. Kiselev, G.C. Konyikh, B.S. Korotkevich, M.I. Gasik, A.G. Grinshpunt, V.I. Yemlin, V.V. Kashkul', N.S. Klimkovich, V.G. Kushnarev, V.B. Shcherbitskiy.

Submitted by the USSR Ministry of Ferrous Metallurgy.

47. "Comprehensive Development and Assimilation of Highly Efficient Wire-Drawing Technology Under Hydrodynamic Friction Conditions"--V.V. Arsen'yev, R.B. Baraz, Kh.N. Belalov, B.S. Volosastov, G.M. Vorob'yev, S.I. Zavarov, I.N. Nedoviziy, V.I. Orinichev, S.I. Orlov, S.I. Pozdnyakov, V.A. Samoylov, M.S. Tarasenko, S.A. Terskikh, V.I. Fedorov, V.P. Fetisov, L.I. Shchetkin, S.I. Kirnitskiy, Yu.V. Pupchenko, V.L. Kolmogorov.

Submitted by the USSR Ministry of Ferrous Metallurgy.

The titles of the works and the groups of authors are indicated as submitted. In publishing the list of works accepted for participation in the competition the commission requests that the leaders of departments, scientific-technical societies, scientific establishments, enterprises and educational institutions conduct public discussion of the works and their author groups.

All comments, discussion material and observations on the works and their authors should be addressed to the State Committee for Science and Technology, USSR Council of Ministers Prizes Department at 103905, Moscow, K-9, ul. Gor'kogo, 11, tel: 229-03-05, 229-14-49, 223-73-07 before 10 January 1983.

8850
CSO: 1814/64

SCIENTIFIC-TECHNICAL SOCIETIES' SCIENTIFIC CONTRIBUTION

Moscow EKONOMICHESKAYA GAZETA in Russian No 4, Jan 83 p 15

[Article by Doctor of Economics N. Gritsenko, first deputy chairman of the Scientific-Technical Society All-Union Council: "Intensification of Production Is the Goal"]

> [Text] The Sixth All-Union Scientific-Technical Societies Congress will open on 25 January in Moscow. Some 24 sectorial scientific-technical societies [STS] are currently operating in our country. They unite approximately 11 million scientists, engineering-technical and scientific personnel, agricultural specialists and production innovators. An important field in the activity of the STS organizations is the struggle for the rational use of raw material, fuel-energy and other physical resources and the introduction of waste-free technology.

The intensification of social production on the basis of an increase in labor productivity and economies in the rational use of material resources is currently the prime concern of the STS. The republic and sectorial congresses of the societies showed that the majority of STS members are adopting a proprietorial and jealous attitude toward public property.

The Urals knows how to save metal. Thus the initiative "For the Highest Labor Productivity and Maximum Metal Economies" has become widespread at ferrous metallurgy enterprises of Sverdlovsk Oblast. The Ural Auto Plant STS Council certifies machinery parts for metal consumption. Having created creative teams of specialists of their own and allied enterprises, they surveyed several hundred components and parts here, set quotas for a reduction in the metal consumption norms and introduced a savings indicator under socialist competition conditions. All this has made it possible to reduce metal consumption by 250 kg in the "Ural 43202" automobile.

Many of the oblast's enterprises are now working in accordance with the Ural Plant's method.

Nonetheless, the problem of reducing the material consumption of manufactured products and machinery remains acute. Our country's consumption of metal per unit of national income remains high. There are frequent losses of material

resources at the time of the designing of a product. For this reason the initiative of the STS primary organization of Leningrad's "Elektrosila" Production Association with respect to conducting a public review of the technical level of manufactured products merits the most extensive dissemination. Some 30-40 equipment models are replaced annually at the "Elektrosila".

The STS All-Union Council is paying particular attention to the creation of special sections dealing with questions of reducing material consumption. The municipal and consumer service STS alone has created more than 1,300 such public bodies. Thus in the course of reviews and competitions members of sections of this society's Moscow city board submitted proposals which have made it possible in the city's mass transit to save 14 million kilowatt-hours of electric power and approximately 13 million liters of gasoline.

Toward Waste-Free Technology

An important reserve of the economy is the use of production waste and the creation of low-waste and waste-free technology. There is, after all, a dual benefit here: we protect nature and obtain cheap raw material resources. For example, ferrous metallurgy annually produces more than 45 million tons of blast furnace and approximately 16 million tons of open-hearth ferroalloy slag. Banks of ash, production of which has reached 70 million tons, occupy vast areas.

The societies have set themselves the task of organizing the accounting of waste and certifying it for subsequent use. Thus with the direct participation of members of the All-Union Chemical Society imeni D.I. Mendeleyev Shchekino's "Azot" Production Association has come to use hitherto discarded production waste for the manufacture of dry ice and welding acid to the tune of more than R2 million a year.

With the direct participation of the STS council, which simultaneously performs the functions of scientific-technical council of the enterprise, the Verkh-Isetskiy Foundry has for the first time in the country created a closed water system which completely rules out industrial discharge into the environment. After purification and treatment, all waste-water is used again in production, and use is made of the separated solid or liquid deposits and saline "drained" water. The use merely of a vaporizer instead of a storage pond produces a savings of R300,000 a year and has released more than 220 hectares of land.

This experience is being used extensively in various sectors of industry. For the creation and introduction of the system a large group of the foundry's STS member-workers was awarded the USSR State Prize for 1981.

Saving Fuel-Energy Resources

The problem of the prudent use of fuel-energy resources has always been at the center of the attention of the scientific-technical community. Annual competitions for the best electric power- and fuel-saving proposal are contributing to its solution to a large extent. The latest competition ended recently.

In close cooperation with the USSR Ministry of Power and Electrification assistance commissions under the auspices of "Energonadzor" enterprises examined more than 5,000 proposals, whose introduction made it possible to save 1.8 billion kilowatt-hours of electric power and 6 million gigacalories of thermal energy.

As you know, the development of the country's energy program is being completed. The STS are making their contribution to its preparation. Under the leadership of Academician I.A. Glebov, deputy chairman of the STS All-Union Council, a comprehensive "Energy" Program has been drawn up in Leningrad. This program, in whose creation 28 research and planning organizations, science-production associations and VUZ's participated, embraces 13 subsectors of the economy. It is estimated that implementation of the program will make it possible in the current 5-year plan alone to save approximately 14 million tons of standard fuel. Consumption thereof will decline 10 percent in the 5-year plan in alumina production, and power consumption will decline by 1 billion kilowatt-hours in the smelting of alumina.

Incidentally, program-goal planning forms the basis of STS activity. The societies currently sponsor 62 comprehensive goal-oriented scientific-technical and socioeconomic programs. Many organizations have undertaken to fulfill these programs ahead of schedule, which, of course, will make it possible to economize on labor, intermediate product-raw material and fuel-energy resources. Socialist competition in the STS primary organizations of instrument-building industry imeni S.I. Vavilov has made it possible to shorten the time taken to fulfill 154 stages of the program targets.

Members of the STS primary organization of the Siberian Scientific Research Institute of Metrology are participating actively in realization of the "Metrological Support for the National Economy" Program. In conjunction with members of the STS of the West Siberian Standardization and Metrology Center and the "Etalon" Plant a unique device for testing electronic and digital voltmeters was created 2.5 times more quickly than imagined.

Contribution to Realization of the Food Program

Particular mention should be made of the STS participation in realization of the Food Program. A council has been set up under the STS All-Union Council which coordinates the societies' work on fulfillment thereof. Among the important directions here are the struggle for the preservation of food products and agricultural raw material. A few years ago the scientific-technical community of the Kazakh Scientific Research Institute of Fruit Growing and Viticulture created a fruit repository with a new method of storage of the fruit--in a controlled gas environment. The new technique has given outstanding proof of its advantages in operation. The storage time of apples, pears, grapes, plums, cherries and strawberries has been extended by a factor of 1.5-2.

With another method of storage of agricultural products--on the basis of electroion technology--losses are cut in half. This technology is helping improve the processing of food products, eliminating heat treatment and making it possible to save 65 kilowatt-hours and 200 kg of standard fuel per ton of canned goods.

But the extensive introduction of progressive techniques is being held back owing to the lack of the necessary equipment and instrumentation. Yet the Ministry of Machine Building for Light and Food Industry and Household Appliances is perfectly capable of organizing their production. Nor has the manufacture of equipment for controlling the gas environment been assimilated. The assistance of the Ministry of Chemical and Petroleum Machine Building and Ministry of Gas Industry is needed here.

Increasing the quality of the manufactured agricultural machinery is an important problem. Here is a statistic: up to 40 percent of the per-shift operating time of combines is spent in maintenance and the removal of hitches and failures. In 5 years of the operation of a grain combine expenditure on its repair and maintenance amounts to the cost of a new machine. The scientific-technical community has not yet done enough for the creation and introduction of efficient agricultural units corresponding to present-day requirements.

The societies have one further important aspect of activity. We cannot be thrifty without having learned to determine expenditure and seek out reserves. This is what the public economic analysis bureaus and groups, which operate at thousands of enterprises, are teaching the working people.

The creation of the scientific-economic society, which even now unites more than 500,000 members, is also helping raise the level of economic work.

The STS unite approximately 11 million scientists, engineers, technicians and production innovators. This is a big force, and the STS contribution to the accomplishment of the most important national economic tasks could and should be even more impressive.

8850
CSO: 1814/64

MANAGEMENT OF SCIENTIFIC, TECHNOLOGICAL PROGRESS IN CEMA COUNTRIES

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 12, Dec 82 pp 63-66

[Article by Vladimir Yezerov, Candidate of Technical Sciences, department chief, International Scientific Research Institute on Problems of Management (ISRIPM), and Ashot Khachaturyan, Candidate of Economic Sciences, section chief, All-Union Scientific Research Institute on Problems of Organization and Management, State Committee of the USSR Council of Ministers on Science and Technology: "New Tendencies in the Management of Scientific and Technological Progress"]

[Text] In 1981, CEMA member countries began fulfilling the next five-year plans for social and economic development. During the process of their preparation, comprehensive measures to improve national systems for management of scientific and technological progress (STP), including organizational-economic mechanisms for management of scientific and technological progress (OEMM STP), were developed under the leadership of the communist and workers parties.

The question of more closely aligning the economic structures of the socialist countries was raised at the 26th CPSU Congress. The resolutions on improving OEM STP adopted in recent years in the European CEMA member countries also facilitate this closer alignment. They are very similar, both in objectives and in the means of achieving them.

Common features in improving the forms and methods of managing STP are manifested, first of all, in the priority given to solving tasks of shifting to intensive economic methods, ensuring a growth in industrial efficiency and labor quality, increasing the role of long-term plans, broadening planning horizons, broad use of program-target methods of STP management, increasing the use of economic incentives and levers in managing STP, maximum possible strengthening of the cost accounting mechanism, developing targetted financing of the introduction of scientific and technological achievements, and developing organizational ways of integrating science and production.

The present stage of scientific and technological collaboration requires coordination of CEMA member countries' policies regarding the main questions of scientific and technological progress. In this regard, the 35th CEMA Conference session recommended that an agreement on scientific and technological policy among interested CEMA member countries be implemented to unite efforts to work out problems of primary economic importance, and accelerate the introduction into production of the results obtained. The CEMA member countries' delegation chiefs favored further improving forms and methods of collaboration, including strengthening the sharing of experience in STP planning and management with consideration for possible convergence of the national economic structures.

The 36th CEMA Conference session adopted a decision which stated that coordination of economic plans would not be supplemented by an economic and scientific-technological policy coordinated among interested CEMA member countries. The decision attaches special importance to using the opportunities of the international socialist division of labor for the purpose of accelerating scientific and technological progress.

In October 1981 an exchange of opinions concerning, in particular, organizational forms for the mutual study of STP management experience, took place in Moscow at a conference of committee and ministry deputy chiefs for science and technology. A rough list of questions for the multilateral study of such experience was coordinated. It is intended that the capabilities of international organizations created by CEMA member countries be more widely used for pooling experience, and for developing recommendations for improving STP management systems.

Since 1979, the Internaltional Scientific Research Institute on Problems of Management (ISRIPM), jointly with interested organizations from the Peoples Republic of Bulgaria (PRB), Hungarian Peoples Republic (HPR), GDR, Polish Peoples Republic (PPR), USSR, and CSSR, has set about working on this problem. In the initial stage it was agreed to arrange a constant exchange of information among the countries on the status of OEMM STP and its course of development, with the aim of working out theoretical bases and practical recommendations for studying, pooling, and disseminating advanced experience and the latest achievements of management science in a given field.

At the first international conference of the collaborating group on the topic, "Improving the Organizational-Economic Mechanism for Management of Scientific and Technological Progress," which convened in Moscow in April, 1980, the near term goal for carrying out joint research was formulated. This goal was to accomplish comparative analysis of actually operating OEMM STP in individual countries in order to reveal possibilities for improvement through using the favorable experience acquired. To realize this goal, the conference participants found it advisable to prepare national analytical reviews of the functioning OEMM STP in their countries, to work out a methodology for the improvement and comparative analysis of OEMM STP, and on this basis to conduct comparative analysis of the operating mechanisms for managing scientific and technological progress.

At this time the collaborating group has largely concluded its work on the reviews. They describe, for each CEMA member country, the structure of its organizational-economic mechanism and managing scientific and technological progress, the aggregate of organizational and economic forms and methods of managing STP which it is using, and its operating system for planning the development of science and technology. The reviews also depict the degree to which OEMM STP corresponds to a single mechanism of economic management.

The national analytical reviews permitted the collaborating group to prepare a common review: "The Organizational-Economic Mechanism for Managing STP in the European Socialist Countries." It gives a realistic picture of the characteristics of functioning OEMM STP, and brings out countries' favorable experience, the scope of yet unresolved problems, and the main tendencies for further developing the mechanism for managing scientific and technological progress.

Simultaneously, the collaborating group worked out the theoretical and methodological bases for conducting comparative analysis of national OEMM STP. Thus, specialists from ISRIPM and the Scientific Center of the PRB State Committee on Science and Technological Progress prepared a Methodology for the Study and Comparative Analysis of the Organization-Economic Mechanism for Managing Scientific and Technological Progress, which was discussed and approved at the second international conference of the collaborating group on this theme in February 1981, in Blagoyevgrad, PRB.

In accordance with the methodology, it is intended that preliminary information on OEMM STP be collected in individual CEMA member countries, and that centralized computer processing of this information be accomplished. Data from the analytical reviews, as well as specially developed questionnaire cards, designed to collect analytical information on individual elements of operating OEMM STP, will serve as the basis for obtaining preliminary information.

The national analytical reviews show that in the system of measures aimed at increasing OEMM STP effectiveness, great attention is paid to improving the forms of centralized planning of science and technology development. Today practically identical systems of planning STP, in terms of time periods and structure, have taken shape in the CEMA member countries. The plan concerning science is becoming an important component of the economic plan, and is ever more strongly influencing its other sections. Long-range (to 15-20 years), mid-range (five-year), and short-range plans are included in the CEMA countries' system of interrelated plans for developing science and technology, thus providing continuity of planning decisions. The five-year plan which defines the main parameters of economic and social development, is unanimously recognized as the basic form for planning scientific and technological progress.

A distinguishing feature at the present stage of improving planning of STP in the socialist countries is the broad use of goal-oriented programming methods, aimed at solving specific scientific and technological problems. Currently practically all countries are developing goal-oriented comprehensive programs on actual scientific and technological problems on both

the national economic and industrial branch level. They are becoming the main component in planning scientific and technological development.

For example, in the CSSR, the goal oriented programming approach has been used since the 1960's in planning STP. Scientific and technological programs are developed based on technological and economic concepts and long-term (10 to 15 year) prognoses for the country's economic and social development. Program management is implemented by interdepartmental science and technology coordinating committees (numbering 160), which maintain close contact with interested ministries and departments, associations, and major enterprises.

In the PRB, the National Comprehensive Program for Scientific Development and Technological Progress for 1981-1990 is one of five national long-term programs, which in the aggregate encompass the basic directions of the country's social and economic development. It provides for solving major national and interindustry problems related to improving the structure of production; broadening the raw material base and improving the use of resources, materials, and energy; mechanizing and automating production and management; introducing highly productive technologies; protecting the environment, etc. The program distinguishes 18 basic directions of scientific and technological progress in material production and the social sphere. It includes measures to solve the most important scientific and technological problems in the areas of improving technology and organizing production, improving working conditions, and others.

In the USSR, two types of scientific-technological programs are developed, depending on the final objectives and composition of measures involved: goal oriented, comprehensive scientific and technological programs, and programs for solving the most important scientific and technological problems. The former serve to implement the most significant scientific and technological achievements. The goal of such programs (approximately 40 have been developed for 1981-1985) is to provide in the shortest time possible a substantial increase in industrial efficiency and production quality. Programs of the second type (more than 120 have been approved) encompass individual problems of economic importance and are related to creating types of equipment technology which are new in principle, and bringing them to practical implementation. A listing of all these programs is established by the State Committee of the USSR Council of Ministers for Science and Technology, USSR Gosplan, USSR Gosstroy, and the USSR Academy of Science , during formulation of the 10 year basic directions for economic and social development of the USSR.

In the HPR, 11 state goal-oriented research programs directed at increasing material production efficiency, and 7 primary directions for state research, oriented on economic, social, cultural and other tasks, have been distinguished in the State Long-Range Plan for Scientific Research, developed for the period through 1990.

The strengthening of the directive nature of the plan for scientific and technological development, and the increased role of long-range plans for scientific research, are important events characterizing the development of OEMM STP in the CEMA member countries. Thus, in the PRB, a National Concept for Scientific Development and Technological Progress To 1990 was drawn up in 1978, and served as the basis for developing the National Comprehensive Program for Scientific Development and Technological Progress for 1981-1990. A state Long-Range Plan for Scientific Research To 1990 was developed in 1972 in the HPR, and serves to orient the government in conducting its long-range economic policy.

The main directions of scientific research and development in the USSR, in accordance with the long range tasks of STP, are defined in the 20 year comprehensive program for scientific and technological progress, which ensures continuity and steadiness in planning STP. Similar long-range plans for developing science and technology have also been formulated in other CEMA member countries. They have in common selecting the most promising directions and industries in which to concentrate the resources and efforts of scientific and experimental organizations, and defining important scientific and technological problems of economic significance.

Development of organizational forms occupies one of the central places in the system of measures to improve OEMM STP. During the past decade, the most useful and efficient form of combining science and production was initiated with the creation of major industrial-economic (associations, combines, etc.) and scientific-industrial entities (scientific-industrial associations), possessing powerful scientific-industrial, cadre, and material-financial resources, as well as combined scientific institutions (combined institutes in the PRB, combined research centers in the PPR, scientific-technological centers in the USSR, etc.). The process of integrating scientific research institutes, design bureaus, technological and experimental enterprises included in such complexes is developing within a single system of management.

In the USSR, such organizational forms of linking science and production as industrial and scientific-industrial associations have been most widely developed at this time. The industrial associations are responsible for providing the planned output of high quality serial and mass production items. The scientific-industrial associations are to develop prototypes of new equipment and, when they are perfected, to transfer them to the industrial associations. In other words, the scientific-industrial associations must ensure the technological assimilation of new equipment and technology, and the industrial associations its industrial and economic assimilation. Currently, approximately 250 scientific-industrial associations are functioning in the USSR, formed not only in industry, but also in agriculture, geology and other economic branches. Their experience demonstrates that the scientific-industrial system enables the research-production cycle to be shortened by 50 to 100 percent due to efficient organization of the entire process of developing new equipment. Other forms of combining science and industry are also being tried out at present in the USSR, in particular academic scientific-technological and territorial scientific-industrial associations, etc.

In the GDR and CSSR, approximately 90 percent of the scientific research capability of industrial branches is presently subordinated to industrial-economic associations of the combine and concern types. Sometimes they include several scientific research institutes and other scientific-technological elements. For example, the Khemopetrol concern in the CSSR includes 6 scientific research institutes in addition to 10 petrochemical factories. Out of 35,000 employees in the GDR's Karl Zeiss Jena combine, approximately 5,000 are in the fields of scientific research and experimental design. In the Robotron combine in the GDR, 7,500 of 65,000 employees work in the scientific-technological center.

Presently, experience has been acquired in developing other organizational forms for integrating science and industry. Thus, in the PRB, engineering organizations have been developed and are functioning successfully, which are created to coordinate the process of introducing scientific and technological achievements with investment activities, and to introduce scientific and technological achievements into industry by exploiting national and foreign designs, solutions, licenses, documentation, "know how," etc. These include scientific research institutes, acquisition, assembly, training, trade, and other organizations. Moreover, scientific centers have been dispersed throughout the country. These centers are designed to provide comprehensive scientific services and to introduce scientific and technological achievements into production. Technological servicing of industry in Bulgaria is accomplished directly by development and introduction bases which include planning and design, technological and other elements, and by experimental shops, sections, workshops, etc. Bases for development and introduction are the most widespread type of engineering-introduction organizations.

In the HPR, goal oriented research and development associations are a specific form of combining science and industry. These include the Association for Production of Machine Tools with Programmed Numerical Coding, created in 1970 with the participation of nine major industrial enterprises and five scientific research institutes, and the Protol Scientific-Industrial Association, formed in 1977 on the basis of state economic establishments, university educational departments, and scientific research institutes, and engaged in improving varieties of albuminous and oil-producing plants, etc.

At the present time, considerable and varied experience in developing organizational forms for combining science and industry has also been acquired by other CEMA member countries. Despite the mentioned specifics of these forms, the general tendency is to involve scientific, design and technological organizations directly in the sphere of material production, and to create major industrial-economic entities.

Investments in developing science and technology in CEMA member countries are now growing faster than national income. By this time a uniform structure for financing scientific and technological requirements has been put together. This is manifested by the fact that economic plans and programs are financed through state budget funds, industrial branch plans

through development and technological progress funds centralized at the branch (sub-branch) level, and plans for technologically reequipping enterprises and associations through the cost accounting funds which they have established.

Primarily basic research carried out by the academies of sciences and higher educational institutions is financed directly from the state budget. In some countries (for example the PRB and the GDR) the method of financing all activities in general of organizations and institutes is yielding to a new method, that of goal-oriented (thematic) financing. A large part of the budgetary resources of these countries related to implementing the achievements of STP is directed at financing major measures for new equipment and improving product quality provided for in the state plan (often in the form of goal-oriented comprehensive programs). In the PRB, for example, this part of the budget is collected and spent with the aid of a centralized fund for "technological progress," of the State Committee for Science and Technological Progress. It is intended for financing national interindustry and the most important industrial branch scientific and technological programs, especially important research which is associated with increased economic risk, etc.

Resources of enterprises, economic organizations and scientific institutions themselves are beginning to play an ever greater role in financing STP. In this, special attention is focused on the direct link between financing opportunities and the results of management over the preceding periods, and on increasing the responsibilities of economic organizations for decisions made and the effectiveness with which allotted resources are used.

In addition to funds for industrial development which are primarily investment funds, special funds for technological development are now being created in European CEMA member countries' associations and enterprises. These include a fund for expansion and technological improvement and a fund for assimilating new products in the PRB; funds for technological development in the HPR and CSSR; funds for science and technology in the GDR; a common fund for developing science and technology in the USSR, and others.

Despite the fact that the countries' methods of forming these funds differ, they have a common purpose and identical tendencies for use. Fund resources are used to compensate for increased expenses during development, assimilation and introduction of new equipment and technology into industry, and to finance scientific research and design of new equipment. Part of the resources of these funds is centralized on the industrial branch or state level, which creates the material basis for conducting a unified branch (state) scientific and technological policy.

Improving OEMM STP has taken place with consideration for the specifics of each country and individual particularities in the mechanism for forming and using technological development funds. Therefore, the proportion of the budgetary, in-house, and borrowed resources used for financing scientific and technological development requirements differs. In some countries

(HPR, GDR) a single fund is created to compensate for expenses of developing and introducing new products into industry; in others (PRB) there are several such funds. In some countries, fund resources are also used as an additional source of financing capital investments.

Analysis of operating systems for financing STP permits the conclusion that recently CEMA member countries have refrained both from extremely centralized financing of scientific and technological development not linked to the results of industrial branch and enterprise cost accounting activities, and from excessive cost accounting freedom by an enterprise or industry in forming and using its own resources for scientific and technological development needs.

A search is now underway in all CEMA member countries for mechanisms which more closely link resources allotted for wages with indices of final results of the activities of participants in the scientific and technological cycle. In individual countries this search is characterized by varied scopes, forms and methods, but on the whole a tendency to equalize the objective conditions for forming wage funds is manifested. Planning these funds derives from such common prerequisites as ensuring that plans for scientific and technological development are implemented with available (or even with fewer) personnel. Growth in resources for wages is used not to attract new scientific cadres, but to increase wages in accordance with the growth in efficiency and the increase in cadre qualifications.

As the rate system becomes more flexible, and the link between wage rates and the end results of scientific and technological activity becomes stronger, a convergence in the functional roles of the wage fund and the material incentive fund is observed. They have become oriented to a greater extent on collective material interest, and have become to some extent self-supporting (cost accounting). As a result, the PRB, for example, has even refrained from forming a fund for supplemental material incentives, and all resources for wages are combined in a single fund. In the HPR, profit may be directed not only toward increasing the material incentive fund, but also to increase wage rates.

The role of price-setting has increased significantly in recent years in the CEMA member countries' system of economic incentives for STP. The practice of establishing incentive increases on the wholesale prices of new, highest quality equipment, while simultaneously discounting inefficient and outdated products is becoming more widespread. In most countries the incentive increases in the wholesale price of new equipment are closely linked to the national economic effect achieved through its introduction. The additional profit obtained as a result of wholesale price increases as a rule is used to supplement the economic incentive funds of enterprises and organizations.

Thus, during the last 10 years, the process of more closely aligning the structures of OEMM STP within the framework of measures being implemented to improve the economic mechanism has begun within CEMA member

countries. Today, the task consists of studying carefully and in detail the advanced experience acquired in this area in each country, and then drawing up recommendations for widely disseminating this experience on the scale of the entire socialist community.

9069
CSO: 1814/74

IMPROVEMENTS TO PATENT PROCESSING SYSTEM PROPOSED

Yerevan PROMYSHLENNOST' ARMENII in Russian No 11, Nov 82 pp 54-55

[Article by S. A. Markosyan, director of the Leninakan Branch, Yerevan Polytechnic Institute, candidate of physical and mathematical sciences: "Tasks of the Patent Service"]

[Text] The patent services of enterprises and organizations play an important role in developing inventions in the country, improving the use of discoveries, inventions and innovations in the economy, and increasing the effectiveness of work directed toward creating and developing new models and products.

Ensuring the patent validity of models under development, the identification of a discovery, and the determination of the newness of a proposed solution and its distinctness from already known proposals usually poses significant difficulties. Moreover, since frequently invention applications are not drawn up or are incorrectly composed, the proposal is not recognized as an invention and its essence is written up in scientific articles. Valuable information is lost in this way, and a judicial defense of the new effort becomes impossible.

The main reason for this situation is the lack of assistance to the author of the invention by the enterprise. And it is natural that in one and the same industry, in enterprises having identical engineering and technical personnel, more inventions are registered where the patent service is effective. Thus, of all the enterprises and institutions in Leninakan, the largest number of authors' certificates is obtained at the Analytical Instruments Pilot Plant, since a highly efficient patent service was organized there earlier than at other enterprises.

The experience of the Leninakan Branch of the Yerevan Polytechnic Institute, in which a patent service was formed in 1976, also deserves attention. Whereas previously (during the 16 years of the branch's existence) a total of 14 applications were presented to the State Committee on Inventions and Discoveries of the USSR Council of Ministers, during the past 3 years alone there have been 35. Experience shows that in composing applications and drawing up accompanying documents even such seeming details as providing the inventor with the necessary forms and instructions helps increase the number of applications.

In identifying inventions made while performing employment duties, and drawing up applications for them, the institution presents to the State Committee, along with the application, information about the patent search, and its conclusion concerning the innovation's technical solution, and determines industries where it might be used and its expectable technical and economic effect. If the invention is not related to fulfillment of employment duties, the institution must help the author draw up documents, and, if the development corresponds to the profile of the enterprise, the institution acts as the author's legal representative.

In Leninakan, patent services have been formed at the Analytical Instruments Pilot Plant, the Production Association for Manufacture of Forging and Pressing Equipment, the Strommashina Factory, the Institttue of Geophysics and Engineering Seismology, the Independent Experimental Design and Technological Institute, and the Yerevan Polytechnic Institute Branch. Due to the efficient work of the patent processors, during the last three years alone these enterprises have sent 61 applications to the State Committee, and have received 34 favorable decisions about granting authors' licenses. Fifteen of these were awarded to the Leninakan Branch of Yerevan Polytechnic Institute.

Workers at enterprises and institutions where there is no patent service make use of the services of the republic and city soviets of the All-Union Society of Inventors and Innovators for drawing up applications for inventions. There have been instances when persons queried the Leninakan Branch of the Yerevan Polytechnic Institute regarding drawing up applications. Of course they were given the needed assistance to the extent possible, but this is not a solution to the problem.

IN OUR VIEW, THE NEED HAS BECOME ACUTE TO CREATE, ON A COMMUNITY WIDE BASIS, A CITY PATENT CONSULTATIVE OFFICE AT THE LENINAKAN DEPARTMENT OF THE ARMENIAN SCIENTIFIC RESEARCH INSTITUTE FOR SCIENTIFIC AND TECHNOLOGICAL INFORMATION AND TECHNOLOGICAL AND ECONOMIC RESEARCH [ArmSRISTI], AND IN THE FUTURE, IN THE HOUSE OF TECHNOLOGY. With this solution to the problem, inventors requiring assistance can obtain necessary consultation with duty workers of the enterprise and institution patent services within days and hours. In time, and with the support of city soviet and party organizations, the consultative office could develop into a city-wide patent bureau. Such an organization will render invaluable service to inventors in the city's enterprises, all the more if it will have a full-fledged file of patents. The absence of such a file presently causes inventors serious difficulties.

In Leninakan, definite work is being carried out not only to create patent services, but also to specially train workers in these offices.

Thus, at the initiative of the Leninakan Department of ArmSRISTI, courses on patent processing were organized in the city during 1977 and 1978, which were attended both by workers of the patent services and various specialists of enterprises and institutions. The need and utility of such courses is undoubted, however their short duration (one week) and lecture format are notable shortcomings.

IN OUR OPINION, TO INCREASE THE EFFECTIVENESS OF TRAINING PATENT SERVICE WORKERS, IT IS ADVISABLE TO INCREASE THE LENGTH OF TRAINING (IF ONLY TO A MONTH) AND, MOST IMPORTANTLY, TO CONDUCT PRACTICAL EXERCISES ON FILLING OUT APPLICATIONS ALONG WITH THE LECTURES. These applications should be drawn up by the student after he conducts an exhaustive patent search and draws up a determination about the newness of the proposed invention. Since Leninakan does not yet have a patent file, students should be sent to Yerevan for at least a week for hands-on practice in conducting a patent search in the ArmSRISTI patent library. It seems to us that the Leninakan Branch of ArmSRISTI can organize such courses to improve the qualifications of patent services workers.

However, the best way to train patent processors is to give patent service workers opportunities to receive specialized education at the Central Institute for Increasing the Qualifications of Executives and Economic Specialists in the Field of Patent Work. Only people with higher education can go this institute, which trains licensed patent processing specialists with the highest qualifications. Persons are accepted for attendance only through a preliminary application by the higher organs (ministeries, departments) of enterprises and institutions.

In order to implement our proposals, which are aimed at further improving the situation with respect to work on inventions in the enterprises and institutions of Leninakan, close collaboration of all offices involved is necessary. Only through united efforts can the obstacles along the creative path of the inventor be eliminated. The result will not be long in coming.

9069
CSO: 1814/75

ARMENIAN SCIENTIFIC ACHIEVEMENTS, APPLICATION TO ECONOMY DESCRIBED

Yerevan PROMYSHLENNOST' ARMENII in Russian No 11, Nov 82 pp 2-5

[Article by M. B. Edilyan, deputy chairman, Armenian SSR Gosplan, "Multiplying the Productive Force of Science"]

[Text] Accelerating scientific and technological progress and developing science as the foundation for this progress are among the most important large scale tasks put forward by the 26th CPSU Congress for the 11th Five-Year Plan.

The 26th Party Congress defined clearly that science and technology development must be subordinated to a greater extent to solving the economic and social problems of Soviet society, accelerating the transition to an intensive economy, and increasing the efficiency of industrial production.

Armenia can justifiably be called the science republic. A far-flung network of scientific research institutions characterizes our republic. More than 20,000 scientific associates, including 704 doctors of science and 5,500 candidates of science, are working in Armenian scientific institutions and VUZes. The Armenian SSR Academy of Sciences is a leading scientific organization.

The fact that its productive force is increasing constantly is a characteristic feature of science.

The Armenian Communist Party Central Committee and the republic government are constantly devoting attention to the work of scientific institutions, are broadening their base, strengthening the links between science and industry and improving the management of scientific and technological progress.

Along with managing scientific and technological progress through purposefully planning the Armenian SSR's economic development, the republic's Gosplan is also guiding the organization of scientific research toward important scientific and technological problems, and introducing scientific and technological achievements into industry.

In addition to intensifying basic research, the development of progressive technologies, complexes and systems of machines and mechanisms, and new materials have become the leading thrusts in the activities of the republic's Academy of Sciences and VUZes. Research on specific complexes of scientific and technological programs is being implemented in order to successfully introduce these measures and effectively coordinate science and practical application.

At present, research is underway on 12 specific, comprehensive scientific and technological programs, and 32 programs to solve scientific and technological problems providing for the large-scale economic implementation of the most important scientific and technological achievements approved by the USSR State Committee of the Council of Ministers for Science and Technology, USSR Gosplan, and the Presidium of the USSR Academy of Sciences.

Development is underway on nine republic level specific, comprehensive scientific and technological programs: energy development with consideration for the republic's heliopotential and geopotential; increasing deep extraction of non-ferrous metals and comprehensive use of local deposits of nonmetalliferous materials; developing the saline soils of the Ararat Valley; a comprehensive program for further industrializing construction and assembly work; mechanization of manual labor in the republic's economic branches; protection of the environment and efficient use of natural resources, including in the Sevan Basin; development and introduction into the economy of automated control systems, and a comprehensive system for controlling product quality and industrial efficiency.

Research on more than 100 of the most important scientific and technological problems, including more than 400 topics, is being conducted in the scientific institutions of the Armenian SSR Academy of Sciences, in ministries and in departments.

During the 11th Five-Year Plan, 3,400 most important new technological measures, including 2,680 of union-republic and republic ministries and departments, will be introduced into the republic's economy. These include 290 for assimilating new types of industrial products; 600 for introducing advanced technology; 500 for mechanization and automation of industrial processes; 440 for the basic indicators of the technical level of production and the most important types of products being produced; 140 for computer technology; 660 for introducing scientific organization of labor, and others.

The level of total mechanization and automation of labor in the republic's industry will reach 50.5 percent in 1985, as opposed to 42.9 percent in 1975, including respectively, 58 percent and 49.4 percent in non-ferrous metallurgy; 65 and 50.9 percent in construction materials; 75 and 54.9 percent in light industry; 60 and 32.9 percent in the food industry; 65 and 48.2 percent in woodworking; and 58 and 57.4 percent in domestic industry.

The economic effect of carrying out scientific and technological measures and introducing a scientific organization of labor in the republic's industrial production will total 431 million rubles during 1981-1985, as opposed to 247 million during 1976-1980, or a growth of 70 percent.

The scientific institutions of the Academy of Sciences, ministries and departments have conducted scientific research on 109 problems and 320 most important topics authorized by the economic plan.

Scientific research efforts have been concluded on the most important topics, including:

in physical and technological sciences--development of a tunable laser of picosecond duration, the technology for growing compound fluoride crystals, and development of a powerful copper vapor laser;

in chemical technology--synthesis of compounds to obtain polymers and infusible materials, complete reprocessing of aluminum rich raw materials and polymetallic sulfide concentrates;

in biology--research on Armenian plant dyes for use in the light and food industries, and on spatial distribution of fauna, presentation of data for prognostication of the productivity of Lake Sevan, and the genetic structure of whitefish and specific breeds of trout and recommendations for its improvement;

in microbiological industry--developing methods for preserving cultures of microorganisms with the use of computers, and obtaining new, effective cultures for production of bacterial fertilizers, and others;

in geology--developing criteria for quantitative metallongenic forecasting and geological-economic evaluation of major balanced ore deposits;

in construction and the building materials industry--research on experimental design of low-story residential areas under difficult terrain conditions, and working out recommendations for using expanded pearlite in constructing base series 129 residences;

in agriculture--developing new methods for forecasting agricultural plant pests and diseases in various zones of the republic, and continuing the development of technological processes of canning, briquetting, and granulating feeds, and the equipment for their preparation.

In the recent past alone, production of 276 new types of industrial products has been accomplished in the production associations and industrial enterprises of the republic. These include 25 at enterprises of chemical industry ministries, 57 at electrotechnical, 14 at machine tool, 23 at instrument making, 16 at light industry, 14 at food industry enterprises, etc.

Machine building enterprises have delivered a special radial drill with an elevating and traversing table, electrical discharge cutting machines with a new system of numerically controlled programming, and diamond-electrochemical contouring and finishing machines--Model 4091; all-purpose increased mobility one-ton lift trucks with hydraullic transmissions; 2.5 m^3 cubic meter stationary air compressor with pressure equal to 12 G's (atmospheres); an electrical measuring instrument panel with standard measuring mechanism UN-450.

Light industry has produced knitted garments out of polyacrylic using various types of accessories, men's and women's coats from synthetic leather and velvet, and especially elegant men's and women's shoes with natural bleached rubber soles.

The construction and construction materials industries have produced slag perlite concrete panels and perlite concrete slabs for agricultural products buildings, precast concrete blocks for retaining walls in road building, etc.

The introduction of advanced technology, mechanization and automation of industrial processes in the republic's economy have received special attention. Thus, in non-ferrous metallurgy, work is continuing on increasing intensive development of non-ferrous metal ore deposits through open-pit mining, and introducing collective selection methods of ore enrichment using new reagents.

Work is continuing on further widening the network of computation centers and increasing the number of computers. As of 1 January 1982, computer centers and computers were functioning in 96 republic organizations.

As before, weak production organization, unsatisfactory material and equipment supplying, organization and technological shortcomings, personnel issues, and so forth, are the reasons for non-fulfillment of many measures.

Thus, the Oktemberyan Furniture Factory, due to poor production organization, produced only 45 percent of a selection of frame furniture, and the Furniture Production Association imeni Myasnikyana, due to late completion of start-up and adjustment efforts, mastered only 48 percent of the technology for producing splint-slab boards.

For various reasons, some actions also remain unfulfilled in the ministries of Construction Materials Industry, Procurement, Rural Construction, and others.

As a result of not introducing completely all new equipment measures provided for by the plan, the economy was shorted approximately 2,000 cubic meters of splint-slab boards, 550 frame furniture selections, 77 tons of "Slavyanskiy" and "Gorodskoy" margarine, and 10,000 meters of perlite fiber glass products. More than 7,000 tons of cargo requiring loading and unloading or transporting and warehousing were not fully mechanized.

It should be noted that, although enterprises of a number of ministries annually introduce into production a significant number of measures, they are not always aimed at improving the quality of products. Thus the industrial enterprises of the Ministry of Industrial Construction in 1981 produced only four items, valued at 66,000 rubles, having the State Mark of Quality--less than 0.1 percent of all goods produced; enterprises of the Ministry of the Automobile Industry, produced two items worth 139,000 rubles or 0.2 percent of production; and enterprises of the Ministry of Rural Construction produced no such products at all.

All the enumerated negative facts indicate that inadequate control is being exercised by the leaders of a number of republic ministries, departments, enterprises and organizations, over the execution of the plan for introducing scientific and technological achievements into industry.

The State Plan for Economic and Social Development of the Armenian SSR for 1982 included 13 specific, comprehensive scientific and technological programs and 32 programs for expanding work on the most important scientific and technological problems, whose coexecutors are the republic's scientific institutions and VUZes. These programs have been approved by the USSR State Committee for Science and Technology, USSR Gosplan, and the USSR Academy of Sciences. The specific,comprehensive programs to be completed during 1981-1985 include: creating and introducing new processes for producing small tonnage chemical products, producing and applying effective chemical means of protecing plants and animals from pests, diseases and weeds which are safe to man and the environment; computer equipment; working out the scientific and technological foundation and a system of measures for improving the use and preservation of the country's water resources, including conducting comprehensive research to determine the optimum level of water in Lake Sevan, preserve its quality, and provide for the efficient use and reproduction of the natural resources of its basin, etc.

This year, research is continuing on nine comprehensive scientific and technological programs of significance to the republic, including: a comprehensive program to develop energy with consideration for the helio and geopotential of the republic, increasing the extraction of non-ferrous metals and the complete recovery of ores, the complete recovery of local deposits of nonmetalliferious materials, developing the saline soils of the Ararat Valley, a comprehensive program for further industrializing construction and assembly work, mechanization of manual labor in the republic's economic branches, and others.

In 1982, the scientific institutions of the Academy of Sciences, and union-republic and republic ministries and departments, must complete development work on 111 problems which include more than 300 topics.

It is expected that a number of urgent scientific research efforts will also be completed in 1983, including:

forecasting the water resources, water balance and changes in the level of Lake Sevan to the year 2000, studying the condition of the ichthyofauna food supply depending on the dynamics of fish quantities in the lake, and working out forecasts of its changes;

evaluating new biologically active substances and presenting data for preparation of test batches of lipid hormone analogs and chemical sterilizing agents, development of formulas for mixed feeds, additives and pre-mixes, and preparation of test batches;

basic provisions for transforming the existing Yerevan conglomerate for designing a rural housing, considering natural and climatic, social-demographic, and other conditions of the Armenian SSR.

The republic plans to introduce more the 750 most important new technological measures, including 625 of union republic and republic ministries and departments, including: 51 for assimilating new types of industrial products, 143 for introducing advanced technology, 91 for mechanization and automation of industrial processes, 100 for primary indicators of the technological level of production, 42 for introducing computer equipment, 6 for experimental construction, and others.

Machine building enterprises will master production of new machine tool, instrument, and equipment modifications. The Leninakan Grinder Factory will produce a circular grinder with programmed controls which is less bulky and is manufactured by automated assembly equipment. The Dzerzhinskiy Machine Tool Factory is beginning production of a screw-cutting lathe with numerically programmed controls, Model 16B16FZ, a lathe of higher precision, Model 16L20PF1, and a two-way centering semi-automatic device. The Charentsavan Factory will produce four types of general purpose milling machines of increased and high precision.

The Armelektrodvigatel' Production Association will produce more than 20 modifications of its Series 4A-80 and 4A-63 asynchronic electric motors.

The assortment of furniture manufactured at woodworking industry enterprises will be 20 percent renewed. They are specializing in producing selections for apartments, bedroom suites, and selections of kitchen, upholstered and children's furniture. Special attention will be paid to producing products with standardized assemblies and parts.

Light industry will produce men's and women's coats from synthetic leather and velvet, children's knitted goods woven from extruded fibers, and knitted goods from velvet-like fabric.

The construction and construction materials industries will produce 18 meter span unbraced reinforced concrete framework for agricultural buildings, and slag perlite concrete panels for industrial buildings, and will increase production of new types of products from cut glass and pearlite fiber glass, high quality floor tiles, large diameter corrogated asbestos-cement pipes, and fractionated pearlite sand and slag. Introduction of the new equipment will have an approximate 1 million ruble annual nominal effect.

Machine building enterprises envision further introduction of new, highly productive lines, equipment, and machine tools with numerically controlled programming. Thus, Yerevan Automotive Factory Association enterprises will introduce technological processes for manufacturing bemetallic parts for hydraullic transmission fork trucks, and the Armelektrosvet Production Association will introduce a high capacity assembly line for manufacturing crystal diffusers, a line for producing automobile head lamps, and a number of advanced processes.

Industrialization of construction will be further developed. Thus, load carrying and enclosing construction out of completely prefabricated large-scale elements, assemblies, panels, and blocks will increase, and will comprise 36.2 percent of the overall amount of construction and assembly work, as opposed to 36.0 percent in 1981. The amount of load carrying and enclosing construction and articles built using light-weight concrete will increase from 55.1 percent of the overall quantity of concrete construction in 1981 to 57.5 percent in 1982.

In automotive transport, there will be an increase in centralized hauling of high-volume economic shipments, hauling of freight by tractor-trailers and in container trucks, and bulk shipment of pulverized freight on specialized vehicles.

Comprehensive mechanization and automation of industrial processes will be further developed. The introduction of 170 mechanized assembly lines and automated lines and 27 fully mechanized and automated sections, shops and enterprises is planned for the republic's economic branches.

The level of mechanization and automation of labor in republic industrial enterprises in 1982 will comprise: in non-ferrous metallurgy--54.8 percent as opposed to 49.0 percent in 1979; in the construction materials industry--61.5 percent and 54.0 percent respectively; in light industry--76.4 and 60.6 percent; in the food industry--47 and 30.7 percent; and in the forest products and wood working industry--62.5 and 46.4 percent.

As a result of increasing the technological level of production, labor productivity will increase in 1982: in non-ferrous metallurgy by 0.6 percent; in the construction materials industry by 1 percent; in light industry by 0.5 percent; in local industry by 2.1 percent; and in the forest products and woodworking industry by 1.1 percent.

It is expected that the annual effect of introducing new technology and measures for the scientific organization of labor in the republic's industrial production will comprise 72 million rubles.

The Armenian SSR economic plan for the first half of 1982 envisioned introducing 529 most important new technological measures. According to data of the Armenian SSR Central Statistical Administration, in fact 515 measures were introduced, or the plan was 97.3 percent fulfilled. This includes: for union republic ministries and departments, 431 and 417 respectively or 96.8 percent, of which 173 and 167 (96.5 percent) were for introduction of advanced technology; 56 and 53 (96.4 percent) were for

basic indicators of technical level and products manufactured; 53 and 51 (96.2 percent) for assimilating new types of industrial products; 7 for automation; and 138 for introduction of scientific organization of labor.

There will be an economic effect of approximately 28 million rubles from the introduction of new technological measures in the republic's industrial production.

Implementation of the bold, innovative plans outlined at the 26th CPSU Congress and the May 1982 Party Plenum is an honorable if not simple matter. It requires tireless creative research, mobilizing all the efforts of scientists, engineers, workers and specialists, and all our spiritual and material capabilities. It is necessary that everything possible be done to see that the achievements of science and technology are introduced into industry as soon as possible. This is the ruling requirement of our lives.

9069
CSO: 1814/75

METABOLISM CONTROL RESEARCH IN GRODNO

Minsk SOVETSKAYA BELORUSSIYA in Russian 30 Jan 83 p 2

[V. Kushner interview with Yu.M. Ostrovskiy, chief of a department and corresponding member of the Belorussian SSR Academy of Sciences: "Steps Into the Unknown"]

> [Text] The Belorussian SSR Academy of Sciences' Metabolism Control Department has been operating in Grodno for more than 12 years now. On what and how its scientists are working was the subject of correspondent V. Kushner's conversation with Yu.M. Ostrovskiy, chief of the department and corresponding member of the BSSR Academy of Sciences.

"We are working intensively and fruitfully," Yuriy Mikhaylovich said. "Metabolism is, as you know, the basic method of existence of everything living on our planet. And there is plenty for the scientist to work on in this most intense 'flashpoint' of the material world. Good conditions have been created in Grodno for in-depth scientific quest in the sphere of biochemistry."

[Question] Yuriy Mikhaylovich, the laboratory is considered the basic structural subdivision in long established academic institutes. How is the organizational structure of the Grodno department taking shape?

[Answer] The science-production base and structure of our department are entirely institutional. We have six laboratories and several specialized scientific groups. They are headed by enterprising, talented scientists. These include doctors of sciences P.I. Lukiyenko, V.V. Katelev and G.V. Kovalevskiy. The senior research fellows V.V. Vinogradov, A.G. Moyseyenok, M.P. Sadovnik, F.S. Larin, Z.V. Gorbach, I.I. Stepuro and others are leading subdivisions successfully.

We began with the metabolism control mechanisms and biochemical pharmacology laboratories, and subsequently the scientific groups which had given a good account of themselves were converted into coenzymes and hormone biochemistry laboratories. The alcohol and aldehyde biochemistry laboratory, whose research is known not only in our country but abroad also, has been operating very actively for 4 years now. Finally, the biotechnology laboratory was born about a year ago.

[Question] What are the basic directions of the department's scientific search?

[Answer] At the center of attention is study of the connections between chemical reactions in an organism. Our task is to solve not only theoretical questions of medical-biological science but also assist many production sectors of the national economy, where it is essential to accelerate or slow down this form of metabolism or the other. Struggling for the successful implementation of the Food Program, we are endeavoring to raise animal productiveness, master new methods of controlling their growth and use new disease prevention and treatment methods.

Thus man has availed himself of the fruit of the study of vitamins for approximately 100 years now. They themselves and their derivatives control certain reactions in an organism and, in particular, contribute to the conversion of carbohydrates into fat. But it is sometimes necessary in medicine to slow down this process. In particular, to save some people from obesity. But how to do this? A new and highly promising method is being developed in our department--the use of antivitamins. The assistants of the metabolism control mechanisms and biochemical pharmacology laboratories are conducting research in this area.

[Question] Where might antivitamins also be applied?

[Answer] In medicine--for treating atherosclerosis and certain other illnesses. In animal husbandry for slowing down the process of the conversion of carbohydrates into fat and simultaneously intensifying the increase in meat during fattening.

We often join up with other establishments in our scientific research. Thus assistants of the coenzymes laboratory are operating hand in hand with the collective of the head Moscow institute of the "Vitamins" All-Union Science-Production Association of the Ministry of Medical Industry.

[Question] Yuriy Mikhaylovich, tell us in more detail about the scientists' collaboration with the clinic physicians.

[Answer] The collective of the hormone biochemistry laboratory is working in close collaboration with the clinic physicians of the Grodno Medical Institute, a number of rayon hospitals and the physical culture dispensary. Our assistants are engaged not only in a search for new but also the optimization of the application of known preparations, more precisely, are seeking the most effective doses of hormone application.

There is also much "virgin land" in the collective of the biochemical pharmacology laboratory. It is composite in structure. Pharmacologists and chemists work here. The first are called upon to test new medicines and remove their undesirable, so-called side effects. For example, tests on a number of vitamins and their derivatives as means of controlling the effect of certain medicines are being completed. A method of strengthening the agents employed for narcosis has been developed jointly by the biochemists of our department and anesthesiologists of the medical institute.

The collective of the biotechnology laboratory is engaged in the problem of the efficient use of the waste of chemical production. As yet a large amount of such waste, particularly in the "Azot" Association, is being destroyed in one way or another. Yet protein-vitamin concentrates are being made from the waste of the Polotsk Oil Refinery. Something similar, but from other waste, with other microorganisms and in accordance with different techniques, is being proposed by our scientists.

[Question] The department's work in the sphere of the treatment of alcoholism has become well known in science....

[Answer] Yes, the new alcohol and aldehyde biochemistry laboratory recently acquired a "visa" here. The main area of its research is the discovery of biochemical means of combating alcoholism. Our scientists' developments were evaluated highly at the First International Biomedical Problems of Alcoholism Conference, which was held in Munich.

Hitherto the existing means of combating alcoholism have not been sufficiently effective. Where and how to find new ones? Our laboratory has taken the path of revealing the singularities of man's metabolism which are conducive to the emergence of alcoholism. As soon as these singularities are discovered, biochemical science will issue recommendations: correct such and such in the metabolism, and the dangerous diathesis will disappear. The field of the laboratory's work is original, there being nothing similar in other countries. It was for this reason that we were invited to deliver several lectures in Sweden on the results of our research.

[Question] Yuriy Mikhaylovich, highly representative fora are conducted virtually annually in your department....

[Answer] I emphasize once again that we have a sound science-production base and that the work is proceeding fruitfully. For this reason Grodno is increasingly becoming a place to hold congresses, symposia and conferences on scientific subjects. The first all-union school on biochemistry, particularly on fermentative activeness, proceeded well last year. Its students were young biochemists from Moscow, Leningrad and many other cities--more than 150 persons. Lectures were delivered by the country's leading scientists.

Symposia have also been held on the biochemistry of alcoholism and vitamins and antivitamins. We participate actively in the organization of all-union and republic scientific medical-biological measures. We participate in international congresses and publish many articles in scientific journals. We are in fact performing the functions of an academic institute. A head institute even, if it is considered that the republic Scientific Council for the Biochemistry of Animals and Man operates under the auspices of the department. This means that in Grodno we collect and coordinate all the data on this section of biochemistry and make recommendations during the compilation of the corresponding research syllabus. Our department is even now a member of three all-union scientific councils.

8850
CSO: 1814/64

ESTONIAN ACADEMY OF SCIENCES TASKS DISCUSSED

Tallinn RAHVA HAAL in Estonian 14 Jan 83 p 2

[Interview with Karl Rebane, President, ESSR Academy of Sciences by Asse Soomets, date and place of interview not given: "The Academy of Sciences: Staff and Tasks." Passages enclosed in slantlines printed in boldface.]

[Text] At the ECP 18th Congress there was discussion of the ESSR Academy of Sciences [AS] personnel policies, cooperation with the leading research institutions of our country, and the contribution of scholars to the solving of pressing current problems. How does and how will the presidium of the ESSR AS implement the plans of the Congress? We asked the /President of the ESSR AS, corresponding member of the USSR AS/ for an interview on these topics.

[Question] /How do you rate the scientific staff of the ESSR AS?/

[Answer] Highly. The Academy primarily means the scholars working in it. The Academy includes 19 academicians, 28 corresponding members, more than 80 holders of doctorates, and many, including many excellent, candidates of sciences. Our scholars are at the standards of current science, they have extensive scientific-organizational skills, and they participate widely in the life of the society. We deem the training of young scholars to be of paramount importance.

Our Academy is relatively young, it was founded in 1946. The most valuable achievement from the early years until today has been precisely the development of a corps of scholars meeting modern standards. Thanks to our being part of the scientific system of the world's foremost scientific state, the USSR, we have all the prerequisites for rapid development.

[Question] /The level of scientific development is primarily determined by the scholars' professional competence and ideological-political characteristics. What have the presidium and the party organizations of the Academy done to raise the ideological-theoretical level of the scholars?/

[Answer] The development of a person's professional skills and ideological-political character cannot be viewed apart. A person convinced of the justness of our aims and activities is dedicated and active in his professional work and develops his professional potential fully. Through the development of professional potential (and this is especially true in science) a person's ideological-theoretical level also increases. Having a correct scientific world view it is in my opinion quite difficult to misunderstand what is happening in the world around us. But once one has a complete picture of what is really happening in the world, then it is quite natural and understandable that our party's scientifically justified ideology and activity will be actively supported.

The raising of the staff's ideological-theoretical consciousness in the Academy takes place in a planned manner. For this purpose we have a five-year comprehensive plan, a seminar system, and political training. Our staff participates in large numbers and at various levels in the staging of political dyas in the republic and in the ideological-theoretical work outside the Academy. I think that one of the best ways to raise one's own level lies in the preparation for sharing one's knowledge with others.

[Question] /How does the ESSR AS presidium use the assistance of our country's leading science centers in training personnel through dedicated fellowships and doctoral research? How many scholars are raising their qualifications by paracticing in Moscow, Leningrad, Novosibirsk and other scientific centers of our country?/

[Answer] The Academy presidium, the administrations of the institutes, scholars, engineers and workers in many other fields are broadly and actively cooperating with both the leading scientific organizations of our country as well as with many other institutions and organizations. This is one of those basic foundations that supports us in our drive toward contemporary standards. But the picture in the institutes is varied, according to the various sectors of science. Wherever we are working on new, most modern technologies we have very concrete and efficient ties to institutions outside the Academy (Tartu State University, Tallinn Polytechnical Institute) and outside our republic. This is the case in construction of scientific apparatus, the development, construction and use of apparatus for laser and cosmic research, the manufacture of bioactive materials, also in molecular biology and technogenetics. Neither we nor others can solve such questions with in-house technical means and skills. Actively working on modern complicated scientific, technical and technological problems in cooperation with dedicated and knowledgeable people of the fraternal republics, often learning from each other--thus people develop themselves, not only doctors or candidates of science, but also craftsmen with golden hands. This is especially important in training young scholars engineers, and technicians to modern standards. But I think that there are also fields where we have by far not exhausted all the magnificent opportunities for cooperation. Closer contacts with the leading science centers of our country would make great contributions, especially in developing fresher and more relevant research topics. This in turn would inescapably lead to even closer contacts--once a relevant and difficult task has been posed there

there is usually a greatly increased need for closer contacts with science outside one's republic, often the solution is simply impossible for local material and intellectual potential.

We have close cooperation also in fundamental research. For example, some of our solid state physicists can almost always be seen at the Novosibirsk synchotron laboratory.

The number of students on dedicated study outside the republic has increased recently. In 1981 there were 14, in 1982 16 aspirants. Beginning 1981 a new permanent system for increasing the qualifications of scholars through assignment to the leading centers of the USSR AN and the republics' AN for 12 months has been in effect. Last year 12 persons received such training.

[Question] /What important contributions are social scientists making in raising the effectiveness and quality of ideological work?/

[Answer] In my opinion the most important tasks of the social scientists in the ESSR AN concern thorough research in Estonian history, Estonian language and literature, folklore and folk music, etc., and the publication of such research in definitive works. Without such works there cannot be a scientifically based view of Estonian history, art, literature, etc. One can say with satisfaction that in the late seventies and early eighties remarkable works have been published on which the ideological work in the republic can to a considerable extent be based. I would mention first of all the "Eesti NSV ajalugu" (ESSR history) and the ENE (Estonian Soviet Encyclopedia). Although ENE was not published by the Academy, it came into being with the very active participation of the Academy staff. Further-- "Eesti kunsti ajalugu" (History of Estonian art), "Eesti rahvas Suures Isamaasõjas" (The Estonian nation in the Great Patriotic War). All of these works have been awarded Soviet Estonian prizes. I would also like to mention "Eesti töölisklassi ajalugu" (History of the Estonian working class) that is ready to go to print. The publication of the "Eesti kirjanduse ajalugu" (History of Estonian literature) series is in its final phases.

The large Russian-Estonian dictionary is in print. It will have a very great importance to our culture, to our life in general.

Economists greatly contribute to the treasure of the republic's ideological work. For example, the Institute of Economics, in cooperation with many scientific institutions is compiling the "Comprehensive Program for ESSR scientific-technical progress 1986-2005." There have been traditional monographs and collections publicizing the results of five-year periods, as well as works analyzing the five year periods just ahead.

A survey of the ESSR role in the national economic complex of the USSR and of economic relations with fraternal republics is provided by the pamphlet "ESSR in the All-Union division of labor." It was published on the occasion of the USSR 60th anniversary. It is also of importance that

among our social scientists there are some very productive authors of popular scientific works. Articles for newspapers and periodicals are also being written, making a welcome contribution to ideological work.

[Question] /The food and the energy program play an important part in solving programs facing the entire world.

How do you rate the achievements of the Academy in putting them into effect?/

[Answer] The dialectics of scientific-technical progress have indeed led to the fact that at the end of this century mankind is faced by two great problems--the food and energy problems. Very serious attention must be paid to them. It is most necessary that the great powerful states direct considerably more resources to solving these problems by reducing military expenditures. This though has clearly been expressed in the political declaration recently issued by members states of the Warsaw Pact.

From the standpoint of the energy program oil shale research is most important to our republic. Currently oil shale is successfully being used to produce electricity and this can continue in the future. But it is also possible that production of motor oil from oil shale will become practicable in the future.

It was evident at the session of the coordinating council of the USSR AN and the republics' AN held in Tallinn last July and primarily devoted to energy, including oil shale, that these questions are of major importance to the USSR as a whole. The greatest recognition of oil shale research came in 1980 when the USSR state prize was awarded to shale-fueled generating stations. Among those honored was the vice president of the ESSR AS academician Ilmar Opik.

In recent years the AN has again seriously expanded oil shale research (in the intervening years interest in solid fuels declined in the entire world, including the USSR as new oil deposits were discovered and exploited). For this purpose a program for oil shale use has been compiled. The most difficult fact is that with the temporary decline in interest in oil shale a critical shortage of specialists has occurred, something that cannot be easily overcome. It goes without saying that we should again begin receiving oil shale specialists from the Tallinn Polytechnical Institute.

The Academy must exert itself to assure that we achieve the necessary standard in this complex problem that is once again very acute.

Agricultural research has been included in the republic and union programs that in turn usually are part of the food program. The major job is being done by biologists, especially in the Institute of Experimental Biology. But first I would like to draw attention to the bioactive compounds we synthesize, such as the pesticidal pheromones. This work deserves high praise since a pheromone synthesized by our chemists is used extensively in grain growing areas of the USSR. Pheromones can also be used successfully in the preservation of foodstuffs, such as stored grain.

We are also successfully manufacturing prostaglandins. These are urgently needed in the application of molecularbiological technologies in agriculture, in livestock breeding, and also scientific research. For this purpose we deliver them to various central research institutes. Prostaglandins are used in modern medicine. Thanks to the support of the USSR Gosplan and republic organs we have been able to have some modest construction to expand the experimental production of these vital substances.

I would also like to mention technogenetics, a new field in our republic, but a successfully developing one. Research in this field, performed by the Academy in cooperation with Tartu State University, earned Soviet Estoniana prize in 1980. Currently technogenetical work is aimed at production. If this proceeds successfully a significant contribution to fulfilling the food program can be expected.

[Question] Where does the AS presidium see opportunities to strengthen ties between science and industry?/

[Answer] Practical experiences of the academics of science show that we help industry whenever we have selected correct tasks for ourselves. That is to say, tasks whose solving interests industry and is at the same suitable for the AS. The AS is first of all a solver of the latest research-intensive problems, the developer of latest technologies, and a facilitator of their implementation. Thus the Academy's research focus should become even more acute, more contemporary, problems of the highest scientific standard should be posed. At the same time the development of the Academy's technical and technological base must continue. Without this one often cannot seriously talk of deliberate research or implementation. In several fields the Academy has quite a considerable technical and technological basis, thanks to the decisive assistance of the USSR AN, the USSR Science and Technology Committee, and the government of the republic. I believe that we have been able to justify the existence of this material-technical basis. We have reason to begin solving technological problems and to receive additional resources for the next, more complicated level of these tasks from the USSR AN, the Science and Technology Committee, and industry.

It is important that work assigned to us for implementation not remain in the limited confines of the Academy, but that it be opened to the outside. For this reason creative and practical contacts should be established with those collectives who would assume the production.

But there are fields of production where the products are made in very small quantities, but where still highly qualified workers are needed, as well as a complicated technological base. The manufacture of such substances could for some time remain with the experimental production facilities of the Academy. For example, extremely pure ferments (some of which are exported) are separated immediately in the research laboratory of the Institute of Chemical and Biological Physics, since the production of such substances requires an environment that exists in a high-level research laboratory.

9240
CSO: 1815/19

NEW TECHNOLOGY ENHANCING GEORGIA'S ECONOMIC EFFICIENCY

Tbilisi ZARYA VOSTOKA in Russian 19 Feb 83 pp 2-3

[Article by Valentina Mishina, senior research assistant at the Georgian SSR Academy of Sciences Institute of Economics and Law and candidate of economic sciences: "Efficiency of Scientific-Technical Progress"]

> [Text] Comrade Yu.V. Andropov emphasized at the CPSU Central Committee November (1982) Plenum the special role of scientific-technical progress in increasing the intensification of social production and the efficiency of the national economy and observed that the rapid introduction in production of the achievements of science and technology and progressive experience contains major reserves in the successful and speediest accomplishment of the tasks set in the current 5-year plan.

The basic directions and rate of scientific-technical progress are determined by the high goal of the Communist Party's economic strategy--an unswerving upsurge in the people's material and cultural living standard and creation of the best conditions for the all-around development of the personality.

Scientific-technical progress ensures the growth of social labor productivity and an improvement in the entire system of social relations, changes the conditions, nature and content of work and contributes to the all-around development of the personality and the formation of the man of the communist society.

Under the conditions of the economy's transition to an intensive path of development the basis of the growth of national income and the people's well-being is increased labor productivity. And it was not fortuitous that so much attention was paid to this problem at the Georgian Communist Party Central Committee Sixth and 11th plenums and the recent party-economic aktiv meeting.

In the last decade the social labor productivity growth rate in Georgia outstripped the union-average indicators. In terms of these parameters the republic emerged in second place in the country in the Ninth Five-Year Plan and in first place in the 10th. In the past 5-year period social labor

productivity in the republic grew 38 percent, with an average growth rate for the country of 17.4 percent. Some 86 percent of the increase in the national income and 74 percent of the increase in industrial output were obtained thanks to this factor in this period in the republic. Nonetheless, in relation to the union-average indicator the level of labor productivity in the republic constitutes only 85.3 percent.

The growth of labor productivity is a most important social result of the introduction of new technology. It ensures the increased production of material benefits and the increasingly full satisfaction ofmaterial requirements; and changes the correlation between work and free time, thereby creating a prerequisite for the growth of the latter and, consequently, improved conditions for a rise in the working people's cultural-technical level.

On the basis of the growth of labor productivity in the 10th Five-Year Plan the Georgian population received 34 percent more payments and benefits than in the Ninth, and real income per capita increased 30 percent in this period. Implementation of the measures planned for the 11th Five-Year Plan in respect of social development and the upsurge of the people's well-being continued in 1981-1982. The average monthly wage of workers and employees rose from R148.5 in 1981 to R151.5 in 1982 and kolkhoz members' pay by 6.5 percent. Last year the population received from the social consumption funds payments and benefits totaling R2,034,000,000, which was almost R94 million more than in 1981.

The 11th Five-Year Plan is aimed primarily at the intensification of production, an acceleration of scientific-technical progress and an all-around improvement in management of the economy.

In the first year of the 5-year plan the republic's national economy took yet another confident step forward in overcoming the existing lag behind the union-average level in labor productivity. However, the situation was aggravated in 1982. There was a decline in the labor productivity level at virtually one out of every three enterprises, primarily those under the jurisdiction of a number of union ministries, and also in the republic Ministry of Rural Construction, Ministry of Light Industry and Ministry of Forestry.

An analysis shows that, in addition to objective factors, as was the case in enological industry, of decisive significance in this lag was the slackening of attention to the quest for labor productivity growth reserves and, primarily, to an acceleration of scientific-technical progress.

We cannot fail to draw attention to the fact that there was a decline in expenditure in such labor-saving areas of technical progress as production mechanization and automation in the 10th Five-Year Plan compared with the previous one. Endeavoring to obtain results as quickly as possible, enterprises introduced as many small-scale measures producing rapid results as possible. Their recoverytime has declined, it is true: for mechanization from 4.9 years in 1975 to 0.9 years in 1980 and for automation from 4 years to 1.1 years. But this approach does not provide for the laying by of dependable reserves for the future. And this is beginning to be reflected in the results of production activity.

For this reason exceptional importance for the successful fulfillment of the tasks of the 11th Five-Year Plan and the longer term, and we should be thinking about this right now, is attached to the skillful combination and selection of the most rational versions of the introduction of new technology ensuring results not only today but in the future also. It is necessary to make skillful use of the fruit of scientific-technical progress, borrow experience and determine the advantages of the new more rapidly and adopt it, as is being done, for example, at the Tbilisi Aviation Plant imeni Dimitrov. Good experience in this respect has also been accumulated at enterprises of Poti, which fulfilled the 1982 plan in 11 months and where labor productivity in industry increased 13 percent and was responsible for 96.4 percent of the increase in output. At the same time, however, there are many enterprises which were unable to realize the plans for the introduction of the achievements of scientific-technical progress, particularly with respect to the automation of production processes. An example is the Rustavi Chemical Plant, which last year disrupted the plan for the introduction of new equipment and the manufacture of particularly valuable products.

The introduction of accomplished production processes and automated machinery systems is changing the nature and content of labor fundamentally. The basic trends in this direction are an increase in every possible way in mechanized and a reduction in manual, particularly, heavy labor.

Unfortunately, there are still many unresolved tasks in this sphere here in the republic. The proportion of automated equipment in the republic's industry constituted only 7.6 percent of the total value of machinery and equipment at the end of 1980 and was even lower--6.8 percent--in engineering and metal working. Currently 55 percent of the total number of workers is employed in manual labor in Georgian industry, including 15 percent in heavy manual labor. The lowest level of mechanization and automation of labor is observed at food industry enterprises, despite the fact that a considerable proportion of the technical facilities installed in the last decade accrues to this sector. And it is primarily a question of the fact that this work has not been performed comprehensively: the overwhelming proportion of enterprises is equipped with mechanized lines, whereas the proportion of enterprises with comprehensively mechanized and automated sections and shops is small.

The basic parameters of the solution in our republic of major scientific-technical problems have been determined on the basis of a comprehensive program of scientific-technical progress for the period through 1990 and goal-oriented comprehensive programs. The main attention in them is focused on a rise in the technical level of production, the introduction in every possible way of the comprehensive mechanization and automation of production processes, the technical refitting of the leading sectors of industry, a constant reduction in all sectors in the number of workers employed in manual labor, primarily in auxiliary production, the creation of special equipment for the republic's rapidly developing agriculture, the development and introduction in production of material-saving production processes and the assimilation of new types of industrial product. Priority in implementation of the above measures is given engineering as the basis for the retooling of the entire economy.

Implementation of the comprehensive program to reduce manual labor, particulary at auxiliary works, began in the republic in 1981. Some 16 scientific-technical programs are being implemented now. Some 152 mechanized flow lines and transfer machines were installed at industrial enterprises, more than 70 sections, shops and works were switched to comprehensive mechanization and automation and 13 automated systems for accounting, planning and management were created in 1982.

Considerable attention is being paid to the assimilation of new products. The manufacture of 43 models of new equipment, including instruments, automation facilities and computers as half of them, was assimilated in 1981 and the manufacture of more than 60 models, whose technical level corresponds to or surpasses the parameters of the best national and foreign analogues, was assimilated in 1982.

More than 350 measures were implemented in 1982 altogether on the assimilation of new types of industrial product, the introduction of progressive techniques and the mechanization and automation of production processes.

Thus both basic directions of scientific-technical progress, attention to which had slackened somewhat in the 10th Five-Year Plan, have been actively developed in the 11th.

And a big role is being performed here by the republic Coordination Council for Science and Scientific-Technical Progress, which purposefully concentrates the efforts of the scientists and production workers on the unconditional fulfillment of the decisions of the Georgian Communist Party Central Committee Sixth Plenum. At a recent session of the Coordination Council particular attention was paid to problems of the strengthening of the partner relations between science and production and acceleration of the practical introduction of the achievements of science and technology. It was deemed essential to intensify the cooperation of scientific establishments and industry and hold enterprise and institute leaders more responsible for the development and assimilation of new types of product and the introduction of progressive technology.

The training of personnel and a rise in workers' industrial-engineering skills are being undertaken in parallel with the accomplishment of tasks of the retooling of the economy.

The creative initiative and active interest of the masses in the achievement of the end results of work are growing. This new attitude toward work is being displayed most strikingly in the development of socialist competition and the movement of efficiency experts and inventors and their increasingly great orientation toward an acceleration of scientific-technical progress and the intensification of production.

The republic's working people have now adopted socialist pledges for 1983. They concentrate great attention on the introduction of measures with respect to new equipment. Thus it is planned in Tbilisi to install and commission at industrial enterprises no less than 55 automatic, mechanized and conveyor

lines and 650 units of new highly productive equipment, modernize more than 450 machine tools and units, transfer approximately 3,200 persons from manual to mechanized labor and obtain additional profit of R3.1 million thanks to the introduction of measures in respect of new equipment.

In speaking of the significance of scientific-technical progress in our life we may distinguish two aspects thereof--economic and social results.

The economic result is characterized by an increase in national income obtained thanks to the growth of labor productivity as a result of scientific-technical progress. This determines the socially useful result and economic contribution of new technology to realization of the goal of the socialist economy--an upsurge of well-being and the all-around development of the personality.

The social result of scientific-technical progress is characterized by an improvement in the system of social relations, changes in the ecological environment and content, conditions and protection of labor and society's all-around development.

These categories are organically interconnected. The economic result is the basis of the social result. In turn, the growth of the social result creates better conditions for the growth of economic potential.

The most efficient directions of the development of new equipment are chosen and the scale of its introduction is determined on the basis of calculation of the national economic result, the summary indicator of which is the increase in national income.

The annual national economic result of scientific-technical progress is expressed in the increase in national income in a year obtained thanks to this factor. The essence of the national economic result from new equipment consists of the total savings of live labor and producer goods obtained from its application. Account is taken of all expenditure on the creation and operation of the equipment as a whole. Deduced expenditure per unit product produced with the help of base and new equipment is calculated first. The formula of deduced expenditure characterizing total expenditure of embodied labor on the production of a given type of product is used for the calculation. This expenditure represents the total production costs of a unit product and normative profit. The latter is defined as the product of proportional capital investments in production capital per normative capital investment efficiency factor.

The normative efficiency factor is the bottom line of the efficiency of capital investments. If the investments produce a profit below this line, the corresponding version of new equipment is deemed inefficient. In order in all sectors of the economy and in all measures to ensure an identical approach to an evaluation of the efficiency of the use of additional national economic resources this indicator is taken as being 1. It is currently fixed at the level of 0.15, that is, an annual profit of no less than 15 kopecks should be obtained per ruble of capital investment.

The difference of the deduced expenditure in terms of the base and new equipment multiplied by the annual volume of the production of products with the aid of new equipment in physical terms determines the national economic result.

The annual economic result from the introduction of new equipment and progressive techniques in the republic's industry increased by a factor of 1.8 in 1980 compared with 1975 and in such areas as progressive techniques by a factor of 1.9, mechanization of production by a factor of almost 2.1, production automation by a factor of 1.2, computer equipment by a factor of 1.6 and the assimilation of new types of industrial product by a factor of 1.6.

Besides the national economic result of new equipment, the efficiency of scientific-technical progress is defined as the relationship of the increase in national income to the expenditure which brought about this increase. The indicator of the overall efficiency of capital investments is used in practice.

The efficiency of capital investments in new equipment in the republic's industry is growing consistently--almost 2.5 times more profit per ruble of expenditure was obtained in 1980 than in 1975. The efficiency of expenditure on progressive techniques--mechanization and automation of production--was particularly high in 1980.

The national economic result determines the profitability of new equipment for social production as a whole. Its profitability for an enterprise, however, is determined by the financially autonomous result, that is, the increase in profit which it obtains in the process of production and use of the new equipment. Its source is the savings from the reduction in production costs, the enhanced quality of the product and the increased scale of production.

Both the national economic and financially autonomous results reflect the saving of embodied labor obtained from scientific-technical progress. The two indicators are interconnected. The national economic result is transformed into the financially autonomous result, being its basis and source. The financially autonomous result is a form of the national economic result.

The introduction of fundamentally new equipment surpassing the best world and national models, that is, highly efficient equipment transforming production, is an urgent requirement of the present day. This is a guarantee of the successful realization of the plans outlined by the 26th CPSU Congress for the current 5-year plan and the immediate future.

8850
CSO: 1814/69

REQUISITE QUALITIES OF A SCIENTIFIC LEADER

Tbilisi ZARYA VOSTOKA in Russian 13 Feb 83 p 2

[Amiran Mgeladze interviews Georgian scientists: "The Authority of the Leader"]

[Text] The role of scientific organizers who have to tackle a complex set of problems--from the need for a systematic increase in the level of scientific research through the creation of the most favorable moral-psychological atmosphere in the work collective--is growing in our day. This was mentioned by everyone with whom ZARYA VOSTOKA correspondent Amiran Mgeladze conversed: Prof Irakliy Zurabishvili, director of the Georgian Academy of Sciences Institute of Mining Mechanics, Docent Ninel' Ratiani, director of the Georgian Scientific Research Institute of Textile Industry, Semen Kadagidze, rector of the Institute of National Economic Management and deputy chairman of the Georgian SSR State Committee for Science and Technology, and Docent Revaz Kvartskhava, head of the Social Psychology Department of Tbilisi State University.

At the same time they touched on a whole number of relevant questions connected with various aspects of the organization and control of scientific subdivisions.

Correspondent: The opinion is held by a certain part of the scientific community that the leader of a scientific research department should primarily be an important scientist. His organizing capabilities and administrative skills are relegated to a secondary position here. And whether the leader is capable of running operations in an economically expendient or simply basically competent manner and whether he possesses the legal knowledge necessary for the competent observance of labor legislation are virtually disregarded.

R. Kvartskhava: There is an explanation for such an opinion. The top scientist is capable of formulating the optimum scientific curriculum for the institute corresponding to the most modern directions of a concrete sphere. Such a scientist enjoys, as a rule, high authority. This is an additional

psychological factor making it possible in many instances to avoid undue bureaucratic administration. After all, the scientific leader is not only a person enjoying recognition but also one with influence.

Correspondent: However, even a gifted, well-known scientist is not insured against erroneous administrative decisions.

R. Kvartskhava: Indeed. However, authority helps him here also. Of course, not to be able to insist on having his way, for all that, but to acknowledge the erroneousness of his decisions. As a rule, a scientific collective interprets correctly such a candid admission of his mistake by a leader. This only strengthens his authority, and trust in him grows.

S. Kadagidze: None of this, however, does away with the need for special training for scientific organizers similar to that which is undergone by management executives. It is perfectly obvious that a lack of the appropriate training is not made good either by personal scientific achievements or high authority and makes considerably more difficult the formulation of the optimum structure of the scientific research department and mutual business relations with the scientific and productionpartners and is frequently a cause of financial violations, labor disputes and interpersonal conflicts. Under modern conditions achieving the high efficiency of leadership is impossible without possessing scientific knowledge in this sphere of activity and the methodology of leadership since there are general characteristics in controlling a collective. This is an urgent command of the times. Judge for yourselves. Students of the Institute of National Economic Management take in the process of tuition a course in management theory. They are familiarized with the basic specifics of a leader's work and acquire the ability to conduct seminars and the reception of citizens and to address a collective. The students participate with invariably great interest in the professional game "Letters and Petitions," in the course of which they learn to investigate the correspondence correctly and submit resolutions. They are also familiarized with the socio-psychological aspects of managerial work: the principles of the formation of the collective, the organization of the mutual relations of the leader and subordinates and the leader and the public organizations and the means and methods of rallying the collective. They study labor and business law, taking here a course in programming with the aid of computers, on which diverse situations requiring managerial decisions are modeled, and master methods of the use scientific-technical data. A basic aspect of tuition is undertaken by the departments of socioeconomic planning and finances and the mathematical foundations of management. The students also take such courses of instruction as streamlining of the economic mechanism, planning and forecasting and accountancy.

N. Ratiani: I agree entirely. Many of our scientific organizers still lack managerial knowledge and skills. As you know, every leader of a scientific research department engages in a vast amount of business correspondence, but far from everyone knows how to write business letters, unfortunately. The same applies to the compilation of orders and memos. A lack of the elementary skills of clerical work and office procedures makes a leader's activity appreciably more difficult. A whole set of complex financial-economic problems inevitably arises in each scientific research department.

Having headed an institute, I saw with my own eyes how important it is for a director to comprehend this question in depth. I had to master the fundamentals of accounting and grasp the principles of compiling the institute's financial report independently.

I. Zurabishvili: Undoubtedly, the special training of a scientific research institute director is essential, but at the same time I believe that the mere presence of important scientific services testifies that the expert possesses organizer's capabilities. And here is why. In the majority of branches of modern science achieving high scientific results is impossible without knowing how to organize collective work and without having become a skillful organizer.

Correspondent: A legitimate question arises. What personal and professional qualities, then, should obligatorily be inherent in the scientific organizer? What might contribute to the success of his organizing activity?

S. Kadagidze: Today it is not enough to dispose of a certain number of high-grade specialists. The main thing is uniting them into a productively operating functional whole. That is, ideally this group acts as a single research worker whose creative potential is increased many times over. An extraordinarily important question which the scientific administrator can and may assume is determination of the optimum size of the collective. The swelling of the staff and an unjustifiably large number of scientific assistants leads to many of them, particularly those who are just starting out, being unable to show their worth, and, consequently, the leader is not in a position to spot and distinguish the most capable and entrust to them the most complex work.

N. Ratiani: The successful activity of the scientific research department leader largely depends, I believe, on the ability to allocate functions in the collective: organizing and research. In addition, a person should not be assigned what he obviously will not be capable of doing. I stick to a few further rules in my organizing activity. I try to issue orders with regard for all circumstances and possible consequences, and once an order has been issued, I follow its realization strictly and having made a decision, I do not change it.

I. Zurabishvili: I consider an essential condition of a scientific research institute director's successful work the organization, together with fundamental, of intensive applied research. And this should be initiated, furthermore, at the stage of the planning of the subject matter of the research. This is achieved in our institute by stage-by-stage planning. Each piece of research consists, first, of a fundamental series of works and is then followed by experimental industrial and design work. And, finally, the third stage is the introduction of the completed scientific research works in industry. However, all this imparts special features to managerial work in science since these processes differ appreciably.

Correspondent: What happens as scientific research moves further away from purely theoretical activity?

I. Zurabishvili: Primarily, and this needs to be taken into consideration, the creative aspect weakens and recedes to a secondary position. The allocation of functions is frequently based not on the personal data of the research workers but is dictated by external conditions, production included. He is more an executant to whom a concrete assignment is given. The demands become stricter and more definite. Under these conditions there is an increase in the role of the scientific research institute's organizational structure.

Correspondent: A central concept characterizing the methods and forms of organizing activity is the style of leadership, which it is customary to divide into democratic and authoritarian. The latter would seem to have compromised and outlived itself long since, but even today instances of many administrators preferring just such a style of work are encountered.

R. Kvartskhava: Let us clarify the basic singularities of each of them. The authoritarian leader supports strict one-man management. He, as a rule, has the decisive say in the choice of research subject matter and, consequently, it is he who develops the central features of planning. He endeavors to ensure that input and output information channels be obligatorily controlled by him. He organizes his managerial activity here such that without him all connections between groups of the collective would break down, that is, he not only proclaims his irreplaceability but also actively reinforces this state of affairs. The leader who adheres to a democratic style of leadership does not endeavor to concentrate responsibility but to distribute it among all members of the collective. In accustoming the employees to independence the democratic leader regards as a yardstick of the effectiveness of his managerial work the successes of the collective operating in his absence. This style of leadership is preferable for the added reason that it makes it possible to raise and train scientific organizers, gradually increasing the complexity and scale of their managerial duties. The authoritarian leader, on the other hand, removes responsibility from his employees, but at the same time does not pay much heed to their rights. The final goals of research are known only to the leader, the rest are only executants. This also makes more difficult the possibilities of the scientific collective's control of the course of research as a whole and, consequently, makes it possible to cover up the erroneousness of a chosen direction for quite a long time.

Correspondent: However, the scientific research department has party and trade union organizations and people's control groups, which have been accorded the right of monitoring the activity of the administration....

R. Kvartskhava: And they are taking advantage of this right increasingly fully. But it should not be forgotten that a leader who professes the authoritarian principle of management by no means aspires to portray himself as some kind of dictator. Frequently he is a top authoritative scientist who enjoys the respect of the members of the collective and is accessible and straightforward in communication. However, his methods of leadership objectively lead to the establishment precisely of the authoritarian principle

and unquestioning subordination. Top scientists and competent scientific organizers can hardly emerge in such a scientific research institute.

Correspondent: Speaking of the style of leadership, we surely cannot overlook such a problem as the functioning of the informal organizational structure, which, it turns out, exists in parallel, as it were, with the formal, official structure. Ideally these structures should coincide, but this is only an ideal. It is often not the case in reality....

R. Kvartskhava: And, furthermore, the most propitious collectives are distinguished precisely by the fact that there is absolutely no concurrence between them. Yet an analysis of the causes of the formation of informal groups could provide precisely the data which would make it possible to effect the optimum personnel, organizational restructuring.

Correspondent: That is, the official structure should endeavor to accommodate, as it were, the informal structure?

R. Kvartskhava: Just so. The structure of an informal organization, sufficiently well studied and analyzed, will enable us to make organizational adjustments, which will necessarily be reflected in the efficiency of scientific work. Leaders should undoubtedly study this informal structure not with the help of their "own people," gossips and devotees of administrative intrigue, which is sometimes the case with leaders who see in informal leaders only rivals, but seriously and in depth. There are numerous and sufficiently well developed socio-psychological methods for this.

Correspondent: In concluding our conversation I would like to put one further question in the "awkward" category. The careerist in science--does such a problem exist and if so, how relevant is it today?

S. Kadagidze: Careerists are dangerous in all spheres of activity. Nor have they disappeared in science. I would like in this connection to recall the words expressed in the report of the Georgian Communist Party Central Committee Bureau to the republic Communist Party Central Committee Sixth Plenum, which sounded as a warning to certain executives of science: "There must not be a situation where those who are in practice developing science and moving it forward remain overshadowed and the scientific administrator moves to the forefront." The careerist is, as a rule, a middle-echelon specialist. Time which is spent by others in professional improvement has been sacrificed by him to administrative advancement. However, having obtained a position in science and, undoubtedly, aware of his scientific unsoundness, he thinks not of the interests of the collective but of retaining his position for himself.

Correspondent: But by virtue of his official powers a leader is obliged to make decisions and, consequently, bear responsibility for them, so does this mean that his scientific and organizing unsoundness is easily detected?

S. Kadagidze: Not entirely so. The point being that such a leader always seeks not the optimum managerial decision but one which essentially solves

nothing. It is roughly like, say, a bad, but deft doctor prescribing medicine on the principle of its harmlessness, which while it does not kill, nor does it cure. The aimless managerial decision leads to the triumph of spontaneous processes demoralizing the scientific collective. And such a leader, furthermore, is not at all interested in a real verification and supervision of the fulfillment of his decisions. He knows their scientific and administrative value. For this reason what is important to him is the mere fact of the making of the decision, which justifies, as it were, his tenure of a given position. The more so in that while snubbing his subordinates he knows perfectly how to get on with the authorities.

Correspondent: Yet this cannot continue indefinitely. Sooner or later the people around him will begin to understand with whom they are dealing....

R. Kvartskhava: Another version is also possible. Those who have been able to understand and put up serious resistance are forced out of the scientific organization. The new employees only comprehend the current situation, and the authorities, if they have indeed seen things clearly, are not always willing to acknowledge the mistake in the selection and assignment of personnel. Thus the time of exposure and the tearing off of the mask is put off for a certain time. But in this time the leader acquires the confidence which he lacked initially, and this gives rise to a feeling that he is beyond punishment and control.

From the editors:

The problem of the leader and organizer in science has been discussed in the past in ZARYA VOSTOKA. Well-known Georgian scientists expressed then a whole number of highly interesting thoughts on what, in their opinion, the modern scientific organizer ought to be like. However, the editorial office resolved to return once again to this question, which is most important for science, since today its leaders are confronted with an entire set of problems which had only just begun to take shape even a few years ago. The significance of scientific organizers under the conditions of scientific creativity's conversion into collective creativity and under the conditions of the industrialization of science is becoming central. It also has to be recognized that many features of organizing work which many scientists, particularly of academic scientific research institutes, have been accustomed to considering secondary have today advanced to the category of the most important. Serious problems confront, in particular, the leaders of scientific research departments in the process of the introduction of scientific developments in practice. A promising way to solve them was proposed at the Georgian Communist Party Central Committee Sixth Plenum. It is a question of the organization of special subdivisions headed by a deputy director for integration with production which will actively seek out partners in the material production sphere and organize partnership. These must be "energetic, creative-minded, resourceful and enterprising" workers "who possess commercial skills and have 'penetrating' capac ity." At the same time, and the scientists mentioned this in their discussion, an acute need has arisen for the special training of scientific research department leaders, which will

increase the competence and substantiation of managerial decisions many times over and serve as a reliable basis for scientific leaders of the modern formation in bold organizational and management maneuvers, without which it is impossible today to imagine the successful accomplishment of all stages of the "research--development--test model--production" chain and science's partnership cooperation with industry.

Many scientific organizers still underestimate the possibilities of social psychology in an increase in the efficiency of scientific work. In addition, the view according to which the assistance of the social psychologist is only necessary for "unpropitious" collectives is prevalent among a certain proportion of scientists. The sources of this opinion are obviously to be found in the fact that social psychologists are as yet offering scientists their help extremely rarely. The scale of the socio-psychological research of scientific collectives in the republic is unsatisfactory.

Of course, the scientists were not able in the discussion to touch on all the urgent problems of managerial work in science currently troubling the scientific community. But one thing is clear. The problem of the scientific organizer now requires a fundamentally new approach consisting primarily of the development of the scientific principles of managerial activity. Accomplishment of the large-scale tasks set Soviet science by the 26th CPSU Congress and the CPSU Central Committee November (1982) Plenum for an acceleration of scientific-technical progress will largely depend on its solution.

8850
CSO: 1814/67

ROLE OF SCIENCE IN FOOD AND ENERGY MATTERS DISCUSSED AT KaSSR ACADEMY OF SCIENCE

Alma-Ata VESTNIK AKADEMII NAUK KAZAKHSKOY SSR in Russian No 9, Sep 82 pp 10-13

[Article: "In the Presidium of the Kazakhstan SSR Academy of Science," passages rendered in all capital letters printed in boldface in source]

[Text] ON REALIZING THE RESOLUTIONS OF THE MAY (1982) PLENUM OF THE CPSU CENTRAL COMMITTEE "ON THE USSR FOOD PROGRAM FOR THE PERIOD TO 1990", THE JUNE (1982) PLENUM OF THE KAZAKHSTAN COMMUNIST PARTY CENTRAL COMMITTEE, AND TASKS OF THE ACADEMY OF SCIENCE SCIENTISTS FOR FURTHER INCREASING THE EFFECTIVENESS OF SCIENCE, STRENGTHENING ITS TIES WITH AGRICULTURAL PRODUCTION.

The May (1982) Plenum of the CPSU Central Committee and the June (1982) Plenum of the Kazakhstan Communist Party Central Committee defined the basic paths and a positive system of measures for the practical solution of a most vital problem--food.

Among the important conditions of its successful realization are a decisive shift to mainly intensive factors of growth, and acceleration of scientific-technical progress.

The Plenum again underscored the enormous role of science in resolving the food program, placing special emphasis on the necessity of further increasing the effectiveness of scientific research, its integration and coordination of fundamental, academic, and branch agricultural science.

For all scientific institutions, as pointed out in the resolution of the Plenum of the Kazakhstan Communist Party Central Committee, "it is important in the shortest period of time to eliminate bottlenecks in processing and preserving agricultural produce, to shorten the term and improve the quality of research, and to achieve accelerated introduction of scientific accomplishments into production."

The KaSSR Academy of Science is conducting a significant amount of research, tied to inquiries of agriculture, part of which has a direct relationship to resolving the Food Program. Exploitations of the Academy are being

developed most successfully, and introduced widely in three directions:

--providing the livestock fodder reserve by rational utilization of natural meadowlands, bringing under pasture reclaimed salt land, enrichment of fodder, and the drawing of additional sources into fodder production.

--introducing new and perfecting existing breeds of sheep, swine, and cattle.

--developing new preparations, means, and methods of combatting diseases of agricultural livestock and plants, and even stimulants and regulators of plant growth.

At the present time a series of work has found, or is finding, wide application--phosphorous fertilizers and deflorinated fodder phosphates from natural raw materials of Kazakhstan, protein-fat concentrate, reclamation of salt lands, utilization of dry bacterial ferments and means of producing inexpensive fodder protein, introduction into production of new highly productive breeds of sheep and swine, long-term technologies of producing fats, and others. At the same time, the effectiveness of using the suggestions of the Academy is still low, and the time of introduction is long. Coordination of research with the institutions of the KaSSR Ministry of Agriculture and the Eastern Department of VASKhNiL (Academy of Agricultural Sciences) is not at the requisite level. The Presidium of the Kazakhstan SSR Academy of Science resolved to adopt the resolution of the May (1982) Plenum of the CPSU Central Committee, "On the USSR Food Program for the Period to 1990", the June (1982) Plenum of the Communist Party of Kazakhstan Central Committee, "On tasks of the Republic Party Organizations, Arising from the Decisions of the May (1982) Plenum of the CPSU Central Committee and Addresses there of Comrade L. I. Brezhnev on the USSR Food Program", by the leadership, to be strictly executed.

Department academician-secretaries and directors of scientific institutions have been instructed to discuss, in the bureaus of departments and enlarged sessions of scientific councils, the resolution of the May (1982) Plenum of the CPSU Central Committee and the June (1982) Plenum of the Communist Party of Kazakhstan Central Committee and to develop positive measures for their realization, in part:

--perfecting the coordination of research with institutions of the KaSSR Ministry of Agriculture and the Eastern Department of VASKhNiL;

--improving the conduct of scientific research on integrated programs, headed by VO (Eastern Department) VASKhNiL;

--accelerating the introduction of completed works in agricultural production;

--reviewing subjects with the aim of stopping research losing reality or duplicating agricultural institutions;

--strengthening propaganda of scientific accomplishments in the press, on the radio and television, and even along the line of the society, "Znaniye", organizing thematical exhibits, and creating popular-scientific films on agricultural themes.

In October 1982, it was planned to conduct a joint session of the General Assembly of the KaSSR Academy of Science and the Eastern Department of VASKhNiL with the participation of the republic Ministry of Agriculture.

The Presidium committed the Commission on the Scientific Foundations of Agriculture, under the Presidium of the KaSSR Academy of Science (corresponding member of the KaSSR Academy of Science A. N. Ilyalyetdinov) to adopt the most active participation in realizing the decisions of the May (1982) Plenum of the CPSU Central Committee and the June (1982) Plenum of the Kazakhstan Communist Party Central Committee; and to present the most outstanding suggestions of scientists in the Republic Interdepartmental Council on Agriculture.

Together with the departments of chemical-technological and biological sciences the Commission has been instructed to prepare a food program project with regard for the suggestions of the Central Asian republics' academies of science.

ON REALIZING THE DECISIONS OF THE 39th SESSION OF THE UNION REPUBLIC ACADEMIES OF SCIENCE COUNCIL FOR THE COORDINATION OF SCIENTIFIC AFFAIRS, UNDER THE PRESIDIUM OF THE USSR ACADEMY OF SCIENCE.

The 39th session of the union republic academies of science Council for the Coordination of Scientific Affairs, convened on 8 June 1982 in Tallinn, considered the following questions:

--tasks of the republic academies of science, scientific centers, and branches of the USSR Academy of Science for developing research in the field of the USSR fuel-energy complex and energy-saving technology;

--the problem of combined utilization of oil shale (for example in the Estonian SSR);

--measures in the USSR Academy of Science and the union republic academies of science in commemorating the 60th anniversary of the formation of the USSR;

--coordination of economic research in the country;

--the course of fulfilling the decisions of the 38th session of the Coordination Council.

In the decisions of the 39th session of the Council, the necessity was emphasized of introducing scientific research and experimental-constructive work in the field of the fuel-energy complex and energy-saving technology, permitting significant improvement in the energy well-being of the country in the shortest time and with the least expenditures. A number of the union republic academies of science successes in optimizing the fuel-energy complex and energy-saving policy was pointed out. Works were shown of scientists of the Kazakhstan SSR Academy of Science on utilizing ash and shale of fuel-electric power stations and, in particular works of the institutes of metallurgy and concentration, of chemical science for utilizing ash as a raw material source for producing stable, durable, wear-resistant glassceramic materials in industrial construction. The application of ash from burned Ekibastuzkiy coal as additional raw material sources of the aluminum industry solves the problem not only of the raw material base, but also protects the surroundings from silicate dust. Work on energy- and resource-saving technologies, and in the field of phosphorous fertilizer production is being conducted on a wide front.

At the same time, the Council session noted that in a number of union academies, among these the Kazakhstan SSR Academy of Science, there is an absence of scientific institutions of the power type.

The session resolved also, that the problem of combined utilization of fuel shale, bituminous sand, and coal for producing artificial oil, chemical raw material and energy is one of the most important economic tasks, in the resolution of which scientific institutions of a number of union republic academies of science, including the Kazakhstan SSR Academy of Science, must take part.

The session outlined measures of the USSR Academy of Science and the union republic academies of science for marking the 60th anniversary of the formation of the USSR.

The session approved the scientific-coordination activity in the USSR Academy of Science and union republic academies of science system for the research of economic problems, and proposed a number of measures for strengthening the coordination of economic research in the country.

With the goal of realizing the decisions of the 39th session of the Council and further raising the effectiveness of scientific research, the Presidium of the Kazakhstan SSR Academy of Science resolved to adopt the decisions of the 39th session of the union republic academies of science Council for the Coordination of Scientific Affairs by the leadership for execution.

The Presidium committed the KaSSR Academy of Science departments of chemical-technological and physical-mathematic sciences to examine the question of intensifying research in the field of the fuel-power complex and energy-saving technology; and to submit suggestions for strengthening and integrating research.

The Presidium of the KaSSR Academy of Science recommended that in honor of the 60th anniversary of the USSR, departments conduct jubilee general assemblies of scientists, and even departmental scientific sessions, scientific-theoretical conferences and enlarged sessions of institute council scientists with the summing up of scientific research, directed at the further development of scientific-technical progress of the country and solving important socio-economic and ideological-educational tasks of developing socialism.

The Presidium committed the KaSSR Academy of Science Department of Social Sciences, and the KaSSR Academy of Science Institute of Economics to work out measures for strengthening the coordination of research in the field of economic science, in light of the decisions of the session mentioned.

12198
CSO: 1814/72

KAZAKHSTAN COMPUTER NETWORK FOR SCIENTIFIC APPLICATIONS DISCUSSED

Alma-Ata VESTNIK AKADEMII NAUK KAZAKHSKOY SSR, in Russian No 9, Sep 82 pp 14-21

[Article by O. A. Zhautykov, Academician, KaSSR Academy of Sciences: "The Mathematization of Science--One of the Important Factors of Scientific-Technological Progress"]

[Text] The investigation of a number of types of human activities in the areas of science, technology, economics, industry, production, economic management policy, etc., leads to a statement of tasks which can be formalized in mathematical terms. Translation of many practical engineering tasks have primary importance for designing certain parts into the abstract mathematical language of dynamic systems is one of the main problems of modern technology.

Presently the problem is being posed of a fundamental change in the technology of planning--that of the automation of planning, requiring the broad use of modern methods of information processing to permit the designer or planner to fully use his technical creative capabilities. This is one of the important problems of scientific-technological progress, which is being given increasing attention, especially in the technologically developed countries where complex technology is developed and introduced to solve the most complicated tasks of economic complexes.

The mathematization of a given branch of science or technology begins with the development of mathematical models, which in the form of certain mathematical correlations link the parameters which define the condition of the subject under study. In order to build a mathematical model it is necessary only to consider the most important factors of the subject being examined which, at that moment, are of research interest.

Employing a mathematical method for understanding processes taking place in a complex situation outside the sphere of mathematics itself is not always accomplished by developing a mathematical model. The fact is that such processes have many complex particularities which are not subject to formalization. In connection with this, one of the main tasks of studying processes, no matter where they may be, consists of combining

these and many other particularities in mathematical models of situations.

In some cases, realistic mathematical models are built with some idealization. However, even they have shortcomings which lead to exhausting the memory and the speed of modern electronic computers. Therefore, constructing realistic mathematical models must consider three main aspects--semantic, analytical, and computational--which must be viewed as a whole and not individually. For example, part of the efforts are spent in translating descriptive tasks, composed in such indefinite terms as effectiveness, optimality, capability, cost, and so forth, into precise analytical tasks, capable of solving various equations and determining extremey. An example of such tasks might be distribution of resources in order to maximize overall income.

Tasks not solvable using known analytical methods must be solved by numerical methods for obtaining corresponding information about the analytical structure of decisions. This approach may be implemented only with the aid of electronic computers which permit mathematical experimentation.

In using a mathematical method in any new complex areas, the task not only consists of transferring a previously existing device to them, but in creating new methods and new concepts. The selection of the mathematical device to be employed will be determined primarily by the nature of the subject being studied.

The effective use of computers for solving complex tasks outside the sphere of mathematics itself uncovers entirely new possibilities for research through modeling various subjects on universal computers.

Continued improvements in the parts and systems of high-speed electronic computers are opening up inexhaustible opportunities for solving the most varied scientific and technological tasks.

For example, computers built on transistorized integrated circuits, which have microprocessors as their primary operating units, are minimal in size and power consumption, and can complete up to several million arithmetic and logical operations per second using binary digits. In addition to computational work, such computers are capable of conducting purely logical operations of analysis, synthesis, correlation, sorting, classification, and so forth.

At the present time, micro-computers, which are developed from a system consisting of a micro-processor, memory, and several secondary circuits, are used in complex control systems, technological equipment for producing electronic items, and in self-governing systems.

During the past 20-30 years, a number of new trends and methods have arisen in mathematics, which are related to the investigation of complex systems and their evolution. These areas include such things as automation

theory, operations research theory, control process theory, game theory, and others.

Tasks of managing processes in various areas of science and technology require, as a rule, improved analytical methods and the creation of the simplest mathematical models of theprocesses being studied. Both of these approaches have the same goal--obtaining substantive numerical results with the aid of modern computers.

All these tasks in the final analysis are reduced to such numerical methods of solving functional equations as the method of consecutive approximations in the field of functions, and the method of approximation of unknown functions by using polynomials or a system of orthonormal functions, etc.

With respect to the importance of combining analytical and numerical methods, it should be said that only from an analytic approach to any field of research can those general laws which lead to a true understanding of the nature of phenomena be determined. If the analytical method is underestimated, the choice of direction for numerical analysis is made more difficult, as a result of which the process of calculating becomes unjustifiably long, or may be completely ineffective. The effective use of the mathematical method for practical requirements will be more efficient when the analytic and numerical approaches supplement and do not exclude each other.

One of the main tasks of process theory and decision making, related to the problem of control, was the automation of information processing processes. As a result of solving such complex tasks of process theory, comparatively new branches of science and technology arose: control system automation, and the theory of decision making (or the theory of operations), which have primary importance to scientific and technological progress. As is well knwon, solving problems of control system automation using precise mathematical formulas is difficult. Nevertheless, the use of numerical analysis computers and possibly algorithmization are necessary. Subsequent development of operations theory and decision making shows that the search for realistic mathematical models, of discrete processes in particular, requires bringing in a broad arsenal of mathematical resources.

Developing computer technology and broadening its operational capabilities are closely linked with solving problems of systems analysis. This requires creating packets of applied programs and program systems, studying mathematical technology and documentation, as well as using the computer to work out problems of dialogue and of accomplishing numerical experiments without special formulas. In systems able to automatically process verbal information, presenting information in words is especially important not only because it simplifies man-machine interaction, but because it broadens the search capabilities of systems analysis.

Important applications have been developed in the Institute of Mathematics and Mechanics, KaSSR Academy of Sciences, related to a number of directions in the development of decision making models and methods. For example,

research on developing algorithms for solving problems of the overall optimization of economic systems has been accomplished. Tasks of optimizing the aggregate of economic entities here are called tasks of overall optimization. The urgency of this approach stems from, on the one hand, the need to improve economic planning by considering the entirety of economic entities and their components' interdependence. On the other hand, optimal decisions permit obtaining additional economic effect through considering the compatibility of economic entities' functioning.

Research into questions of economic-mathematical methods in the Institute of Mathematics and Mechanis had to determine to what extent the tasks examined from an abstract mathematical position correspond to the real conditions of the socialist system of economic management. From this point of view, research applicable to three subject areas was conducted: optimization of plans for the development and functioning of regions of raw material supply, solving problems of water usage, and tasks of the placement of industrial enterprises. The mathematical apparatus used for the first group of tasks involved methods of decision making theory in dynamic models of hierarchical control systems. For the second and third groups, mathematical programming methods were used, especially the approximation-combinatorial method. The problem of developing decisions in dynamic, hierarchical systems requires analysis of some game situation, which is described by a special type of differential game having a fixed sequence of moves and non-opposing interests. Sometimes it requires the combined solution of mathematical programming tasks and of systems of differential equations. A method of optimal distribution of decision making functions in a dynamic system having a two level hierarchical structure, consisting of a Center and Producers is proposed. A certain approach is given toward analyzing the model, as toward a game having non-opposing player interests and a fixed sequence of moves. Questions are examined concerning determining the optimal order for assimilating the area, given the presence of common resource limitations.

An economic-mathematical model was proposed for the optimal location of water lines for the water supply system. The latter was divided into a series of mutually related sub-tasks, for which the following analytical and approximation algorithms were worked out: 1) an algorithm for obtaining the cost characteristics of terrain according to aerial photos, 2) algorithms for solving production and transport tasks with conditions of indivisibility, 3) an algorithm for water usage in the projected network, 4) a method for determining the laws of water consumption for type facilities under given conditions, and 5) a method for automating the planning of water usage in the irrigation network with the aid of computers.

A new algorithm was worked out as a combination of algorithms of the method of consecutive calculations and the approximation-combinatorial method, for solving problems of locating industry. The algorithm permits solving tasks of industrial placement which are complicated by additional conditions and arise during planning. A complex of programs has been created for solving such tasks with unlimited and limited production volumes and with additional conditions. Economic tasks presented by the KaSSR Meat and Dairy Industry and the State Computer Center of the USSR Ministry of Non-Ferrous Metallurgy have been solved with the aid of the complex of programs. The

calculated optimal plans for locating meat-packing plants were the basis for establishing long-term plans for developing the KaSSR meat industry during the 9th and 10th five-year plans, and were confirmed by the KaSSR Gosplan.

Many real tasks of making decisions in technology, economics, control of organizations, etc., require that several qualitative indices be considered. Tasks in which it is necessary to determine the best decision under conditions of many qualitative indices are called tasks of multi-criteria (vector) optimization. This class of tasks is formally an expansion of the tasks of scalar optimization. But this expansion leads to a number of difficulties.

The main difficulty concerns the presence of many independent (optimal according to Pareto) solutions, the pairs of which cannot be compared by vector quality criteria. Therefore, either all these solutions together, or any one of them can be called the solution to the task.

The opinion has arisen that there is insufficient information to solve such tasks, and that it is necessary to obtain information during the process of arriving at solutions from someone who understands the specific task and is concerned about final results. In other words, selection of the bast solution when using vector qualitative criteria is the result of the interaction of formal and informal procedures, the first of which is represented by mathematically formulated tasks, and the second by someone responsible for the solution which is adopted. All this has been expressed in working out man-machine methods of solving multi-criteria tasks of optimization.

A new taks of multi-criteria optimization has been set, the sense of which is to optimize the global system function in a set of independent decisions generated by the vector quality criterion. In connection with the implicit task in the area of determining global system function, the capabilities for its approximate representation with secondary sets, constructed on the based of known methods of solving multi-criteria tasks has been studied. Man-machine procedures for decision making have been developed on the basis of the formulated task.

The task of determining the optimum size of the industrial minimum, and the annual productivity of a group of mines or wells in the all-round development of mineral resources with great calculated economic effect was solved by computer. At the present time, the study of multi-criteria optimizing tasks is continuing, with broad use of the results obtained for solving practical tasks of planning, projecting, etc.

A man-machine procedure decision-making, which solves questions of approximation of one and two-variable functions important in automated control processes has been developed. The procedure is used to solve a number of important practical tasks of VUZ's, ministries and scientific research institutions.

Mathematical assurance of procedures used for planning physical and technical experiments has been worked out jointly with the Institute for Space Research, USSR Academy of Sciences, and the Institute of Terrestrial Magnetism, the Ionosphere and Radio Wave Propagation, USSR Academy of Sciences in analyzing data obtained from satellites, in particular Intercosmos satellites. A computerized system of planning experiments for a package of information exchange system simulation models has been implemented. The system accomplished search algorithm extremes for tasks having variables of differing composition and quantity.

Methods of the mathematical theory of recognition and classification are important in the general theory of decision making. A model for planning extremum experiments, based on experiment classification methods has been constructed. The model permits experiments to be planned having any number of parameters. The results of research on recognition and classification will be important in automation of scientific research.

Research is continuing at the Institute of Mathematics and Mechanics on analyzing and synthesizing automated control systems organizational structures. The urgency of this thrust stems from significant production losses for organizational reasons. The analysis of the organizational structure of a specific enterprise is accomplished by inspecting the enterprise and listing those tasks solvable by computer. The informational and logical structure of the enterprise is constructed.

It is widely known that at the present stage of scientific development, labor productivity in scientific experimentation can be increased by using systems for automating scientific research, based on computer technology. To most completely satisfy the needs for computer resources of the scientific institutions of the KaSSR Academy of Sciences, it was necessary to organize the Collective Use Computation Center (CUCC) under the aegis of the Institute of Mathematics and Mechanics, which is a computer complex employing ES series computers of varying performance with a widely developed network of terminals and local systems for experiment automation based on the computer line.

A Computation Complex is developed on the basis of the Computer Center of the Institute of Mathematics and Mechanics, as stated previously, and includes ES-1022 and ES-1045 computers. The terminal network will encompass practically all the elements of the KaSSR Academy of Sciences which employ computers. Interactive subscriber points will be set up, equipped with video display terminals. Local systems for automating experiments, using the IVK-1 measuring and computing system, are being developed in a number of institutes included in this complex. Interactive display terminals will be available to the users, and will work on a time sharing basis, thus ensuring direct contact of the subscribers with the computer.

As a result of the scientific research efforts conducted to study the nature of information processing work carried out in institutes of the KaSSR Academy of Sciences, the following kinds of work have been isolated: automation of scientific-technical calculations; automation of routine

and complex laboratory experiments; and automation of users' information services.

Any element of the KaSSR which requires information transfer and processing can be a subscriber to the CUCC. The subscriber's link with the CUCC is provided through terminals at the Local Computation Complex (LCC). The LCC, which is developed on the basis of minicomputers (SM-3, SM-4), groups subscribers on a territorial basis. Presently, five LCC subscribers are functioning. In the future, the number and power of local computer complexes will increase.

Functionally, the LCC will receive and process (preliminary or final) information which has come from the subscriber, and as necessary transmit it to the Central Computation Complex (CCC) or other LCCs through a communications computer.

The main computational and informational capacities will be concentrated in the CCC, which is currently equipped with YeS-1022 and YeS-1045 computers, and is capable of being expanded in the future. Linking the CCC with the LCC is accomplished through a communications computer based on the SM-4. Functionally, the CCC provides effective computation and data processing employing local and remote batch processing. The CUCC structure provides for access to individual CCC computers and their programming systems both through the communications computer and through its own terminal systems.

The communications computer is the prototype of a data transmission system which will be created in the next stages of developing the CUCC. To transmit information through the communications computer, a method of changing packets will be used which provides for transmitting independent packets of information.

Thus, the CUCC is a multi-machine, territorially distributed computer network, based on various domestic computer technology resources and representing a unified computer system for the mass consumer, which provides for using its technological resources and information computing resources via on-line time sharing and batch processing in solving basic tasks.

One of the possibilities for applying mathematical methods to the study of complex systems is for solving biological tasks, which, it is true, are still in the preliminary stage.

The need for studying biological subjects and ecological problems becomes more urgent each year. Here it should be kept in mind that the mathematical methods used in describing physical phenomena cannot be used for biological systems, since physical and biological phenomena are not equivalent. One of the characteristics common to biological systems is growth. Consequently, one of the tasks of mathematization of biological sciences is constructing mathematical theories which describe the population's growth process. In so doing, models of varying degrees of complexity must be constructed: models of birth and death, models of combative and predatory populations, and population migration models.

A mathematical model for the short term prognosis of the number of saigas [antelopes] living on Kazakhstan territory has been constructed on this plan in the applied studies of the Institute of Mathematics and Mechanics, KaSSR Academy of Sciences.

At present, complex computer models can be constructed of weed propagation, destruction of grassy crops by leaf beatles, and the propagation of pests of cotton plants, potatoes, alfalfa, grapes, and others.

It is not only necessary to use computers effectively, but to improve computer technology itself.

The patent information group which was recently organized in the Institute of Mathematics and Mechanics has achieved notable successes. A number of inventions in the field of computer technology have been patented abroad.

Computers are used in the Institute of Mathematics and Mechanics, KaSSR Academy of Sciences, not only to solve purely applied problems, but also fundamental theoretical problems. It is here appropriate to mention the work accomplished in the field of the qualitative theory of common differential equations, and the theory of stability. Qualitative and analytical investigation of critical (particular) stability events, related to the reduction (simplification) of differential equations, are accompanied by laborious computational work. In this regard, a problem is put forth to develop an algorithm and compose a program deck permitting normalization and qualitative research to be conducted on so-called parametrically perturbated differential equations. Computer algorithms and program decks in FORTRAN-IV and ALGOL languages have been developed, which have been published in the state collection of algorithms and programs.

The algorithm which has been developed is quite flexible in that it permits recieving normally systems having varied structures, and in that the information entered into the computer is minimal. A number of applied problems of some interest are solved on the basis of the developed algorithm and program decks. These algorithms and program decks can be used by specialists in qualitative research on non-linear mathematical models in mechanics, physics, chemistry and biology.

It is tremendously difficult to put into practice directly results obtained by the analytical method in the area of mathematics. Nevertheless, the methods of solving problems of mathematical physics developed by the Institute of Mathematics and Mechanics has been applied directly to solving specific probelms of natural and technological sciences. For example, a constructive method has been proposed for solving problems of atmospheric optics based on spherical harmonics. The problem of heat and mass transfer in electromechanical liquid-metal bridges and fuses of safety devices has been solved on the basis of composites of the basic decision and the heat potentials for equalizing heat conductivity.

The resolutions of the 26th CPSU Congress open the most important qualitatively new stage in developing science in our country. Science, to an ever greater

degree is becoming a direct productive force, and accelerating scientific-technical progress is acquiring vital importance.

Mathematization of science is one of the main spurs to accelerating the tempo of scientific-technological progress.

Adopting and using the achievements of mathematics in solving practical problems of planning and industrial management, and constructing automated systems to a great extent is linked to effectively using computers and to improving computer technology. In this direction, the Institute of Mathematics and Mechanics envisions further development of both basic and applied research related to functional and analytical methods of differential equations, mathematical physics equations, control theory, computational mathematics, systems analysis, ecology, and other fields.

These are some aspects of the influence of mathematics on scientific-technological progress and its implementation.

9069
CSO: 1814/73

VACANCIES IN KAZAKH ACADEMY OF SCIENCES

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 16 Jan 83 p 3

[Text] In accordance with paragraphs 15 and 16 of its statutes, the Kazakh SSR Academy of Sciences hereby announces KaSSR Academy of Sciences' full member (academician) and corresponding member vacancies in the following specialties:

	Full members (academicians)	Corresponding members
Department of Physico-Mathematical Sciences		
Mathematics	1	1
Physical electronics and radiophysics	--	1
High energy physics	--	1
Engineering cybernetics	--	1
Department of Earth Sciences		
Geology	--	1
Mining	--	1
Geology and geochemistry of nonmetallic deposits	--	1
Department of Chemico-Engineering Sciences		
Petrochemistry	1	--
Organic chemistry	1	2
Physical chemistry	--	1
Metallurgy	1	3
Department of Biological Sciences		
Soil science	1	--
Microbiology	1	--
General biology	1	--
Botany	--	1
Zoology	--	1
Parasitology	--	1
Surgery	--	2

[Cont.]	Full members (academicians)	Corresponding members
Department of Social Sciences		
History	--	2
Philosophy	1	--
State law and soviet building	1	--
Economics	1	1
Literary criticism	1	2
Linguistics	1	1

In accordance with paragraph 12 of the KaSSR Academy of Sciences' statutes, scientists who have enriched science with works of paramount scientific significance containing generally recognized new scientific and practical results are elected full members of the KaSSR Academy of Sciences.

In accordance with paragraph 13 of the KaSSR Academy of Sciences' statutes, scientists who have enriched science with outstanding works and leaders of research into large-scale problems are elected corresponding members of the KaSSR Academy of Sciences.

In accordance with paragraph 26 of the KaSSR Academy of Sciences' statutes, the principal duty of the full member and corresponding member of the KaSSR Academy of Sciences is to enrich science with new achievements and discoveries by way of personal research and the organization of the collective development of leading scientific problems and scientific leadership of this work and to bear responsibility for the fruitfulness of the branch of science in respect of which they have been elected.

Full members and corresponding members of the KaSSR Academy of Sciences participate actively in the elaboration of plans and realization of scientific research, introduction of scientific achievements in the national economy and their use in cultural building and perform work on the training and improvement of scientific personnel; and are obliged to perform assignments of the KaSSR Academy of Sciences Presidium and the corresponding department and also to participate in the work of the Academy of Sciences general assembly and general assembly of the corresponding department.

Scientific establishment and VUZ councils, state and public organizations and full members and corresponding members of the Academy of Sciences are accorded the right within 1 month of the notice to notify the KaSSR Academy of Sciences in writing with the corresponding reasons of the names of the KaSSR Academy of Sciences' full and corresponding member candidates for the specialties indicated in the notice. In the event of the nomination of candidates by scientific establishments, VUZ's and state and public organizations, it is effected at meetings of the academic and scientific-technical councils and boards or presidiums by way of simple-majority secret ballot.

For candidates for full members (academicians) and corresponding members of the KaSSR Academy of Sciences it is essential to forward the following documents

(in duplicate): the written declaration (decision) of the council and state and public organizations or letter with the corresponding reasons for nomination of the candidate, a resume, the personal personnel register file, a list of scientific works (form No 3), copies of the VUZ graduation diploma, doctor of sciences' diploma and professor certificate, a description of the candidate's production-social activity and three 4.5x6 cm. photographs.

The said material should be addressed to Alma-Ata, ul. Shevchenko, 28, KaSSR Academy of Sciences Presidium.

[Signed] Academician A. Kunayev, president of the KaSSR Academy of Sciences

N. Nadirov, chief academic secretary of the KaSSR Academy of Sciences Presidium and corresponding member of the KaSSR Academy of Sciences.

8850
CSO: 1814/68

PRESIDENT OF KIRGHIZ SSR ACADEMY OF SCIENCES REPLIES TO QUESTIONS FROM 'VESTNIK AN KazSSR'

Alma-Ata AKADEMII NAUK KAZAKHSKOY SSR in Russian No 9, Sep 82 pp 3-9

[Replies by M. I. Imanaliyev, president of the Kirghiz SSR Academy of Sciences and member-correspondent of the USSR Academy of Sciences, in article: "Presidents of the Academies of Sciences of the Union Republics Reply to Questions in 'VESTNIK AN KAZSSR'"]

[Text] On the threshold of the 60th anniversary celebration of the formation of the Union of Soviet Socialist Republics, the editorial board of the journal VESTNIK AN KazSSR addressed the presidents of the academies of sciences of the union republics with which the Kazakh SSR Academy of Sciences has creative scientific ties with a request to reply to the following questions:

1. What have been the major achievements of your academy of sciences during the years of Soviet power, particularly in the last decade?

2. What have been the most original scientific studies conducted by your academy?

3. What are the creative ties between and joint developments of your academy of sciences and the Kazakh SSR Academy of Sciences? What are the prospects for their development?

In this issue we are publishing the replies of M. I. Imanaliyev, president of the Kirghiz SSR Academy of Sciences and member-correspondent of the USSR Academy of Sciences.

The publication of these replies will be continued in subsequent issues of this journal. For the beginning of the publication, see No 8, 1982.

Questions 1, 2

Thanks to the constant paternal concern of the Communist Party and the Soviet Government, the selfless assistance of all the peoples of our multinational country, primarily that of the great Russian people, an extensively developed system of special secondary schools and higher educational institutions has been created in Kirghizia during the years of Soviet power, in a territory which, until the October Socialist Revolution, did not have a single secondary educational institu-

tion. In 10 higher educational institutions and more than 40 secondary special educational institutions, the training of highly qualified specialists in practically all sectors of the economy, science and culture in the republic is being carried out. The establishment and development of science in Kirgizia is also exclusively associated with the victory won in the Great October Socialist Revolution. As early as the 1920's and 1930's there were major joint expeditions sent to Kirghizia according to the decision of the USSR Academy of Sciences. Representatives of many of our country's peoples and nationalities served on these expeditions.

Through a systematic study of the tremendous natural wealth and productive forces in the republic, a foundation was laid for the creation of scientific research institutes and for the training and education of national scientific personnel. According to a resolution of the Communist Party and the Soviet Government, a branch of the USSR Academy of Sciences headed by the outstanding Soviet scientist, Academician K.I. Shryabin, was opened in Kirghizia. The Academy of Sciences was founded here in the republic in 1954 on the basis of this branch. The creation of the Kirghiz SSR Academy of Sciences was a significant event in the lives of the Kirghiz people and a shining example of the concern shown by the Communist Party and the Soviet Government for the further development of the economy, science and culture of Soviet Kirghistan.

Today the Kirghiz SSR Academy of Sciences is a leading center and coordinator for practically all the scientific research carried out in the republic.

There are three branches in the Academy of Sciences system: physicotechnical and mathematical sciences, chemical engineering and biological sciences and social sciences. The departments are made up of 17 scientific research establishments--14 institutes, the Tyan-Shan physicogeographical station, the Botanical Gardens and the Department of Eastern Studies.

There are 3,300 people working in the scientific institutions of the Academy. Among these are about 1,500 scientific associates, including about 100 doctors and more than 500 candidates of sciences. Within the Academy there are 24 academicians and 32 member-correspondents.

Having a highly qualified staff at its disposal, the Kirghiz SSR Academy of Sciences carries out a broad range of research in the areas of fundamental and applied sciences which is associated with the pressing problems in the development and distribution of productive forces, the efficient utilization of mineral resources and raw materials and the improvement of the efficiency of public production in the republic. In doing so, the Academy directs its primary attention toward the improvement of scientific-research efficiency and the rapid introduction of its results into the economy. During the years of the 10th Five-Year Plan alone, the scientific institutions of the Academy of Sciences together with other departments and ministries introduced more than 200 developments and recommendations into the economy with an economic impact of more than 80 million rubles.

Soviet Kirghizstan is a major mining and industrial region of our country, rich in its reserves of mineral raw materials and unique and valuable mineral resources. The republic occupies a leading position with respect to its reserves of mercury, is a major supplier of high-quality antimony and turns out more than 20 kinds of products containing rare-earth elements.

The work of our scientists in the areas of the lithology and geochemistry of the sedimentation process and sedimentary ore-formation has been broadly recognized in our country and abroad. They have identified the basic geological conditions and the geomechanical principles involved in the dispersion and preservation of lead, zinc, antimony and other rare and precious metals.

Over the last decade, scientists have determined more exactly the structure of the earth's crust in the territory of Kirghizia, have created a map of the region's plicate substructure and have studied the lithology of ancient sedimentary strata. The results of the research have become the basis for drawing up geological maps of a number of regions in Central Asis and Kazakhstan. This will create a reliable basis for the development of the mining industry in these republics.

Scientists in Kirghizia have achieved considerable success in the area of the study and identification of earthquake indications and the development of a method for dividing regions into seismic zones. On the basis of this research, scientists have drawn up an improved version of a seismic zoning map for the territory of Kirghizia, as well as a seismic zoning map of the Issyk-Kul basin and seismic microzoning maps of the territory of a number of major population centers (Frunze, Osh, Tokmak) and hydrotechnical installations. The scientists' recommendations make it possible to have a sound basis for increasing the number of floors in buildings and structures in seismically active zones and to conserve building materials and structural elements.

The demand for the integrated mechanization and automation of labor-intensive processes in the execution of mining operations and in the building of underground structures has dictated the establishment within the Academy of a scientific direction with respect to the mechanics of machines--the theory of power-impulse systems. On the basis of the scientists' research, new machines and manipulators (industrial robots) have been developed. In cooperation with the country's machine-construction plants, drilling units of a unique design have been created which are being employed successfully in cutting tunnels during the construction of mountain GES's. They are also being used in the mining of nonferrous metal deposits as well as in the mining of a new construction material for the republic--facing stone.

The mountains of Kirghizia are rich not only in valuable minerals. The are a unique natural reservoir of fresh water for the republics of Central Asia and Kazakhstan. In connection with this, the scientists' fundamental research with regard to the development of the theory and practice of integrated water utilization, including the automation of irrigation systems, is of great importance. Successes in this area have made it possible to create the At-Bashinskaya irrigation system which has become an experimental-demonstrative school for many Soviet and foreign irrigation specialists. The developments of scientists in Kirghizia are being extensively applied in the irrigation systems in a number of republics and regions of our country, particularly in the Ukraine and the Povolzhye.

Our scientists are devoting a great deal of attention to fundamental and applied research regarding the chemistry and processing of rare and nonferrous metals, the study and development of nonmetalliferous raw materials and the development of the physicochemical bases for obtaining new compounds.

As a result of the scientists' efforts, specialists at the Kadamzhayskiy Antimony Combine have introduced alkali-potassium methods of obtaining antimony of particular purity and an electrolytic method of obtaining antimony of semiconductor purity. At the Kirghizskiy Mining and Metallurgy Combine, new technology has been introduced for extracting rare elements directly from slurries of semimetallic raw materials which are difficult to process. The application of this new technology has increased the extraction of metal from ore by 20 percent and makes it possible to obtain an economic impact of several million rubles annually.

New technology developed by our scientists for obtaining natural iron powders from industrial tailings is of great importance for the national economy. We are at present mastering the industrial production of high-quality iron powders alloyed with rare-earth elements from tailings at the Ak-Tyuzskiy mining operation. Products made from these powders are noted for their particular strength and do not require additional mechanical treating after stamping. Parts made from iron powders have already found industrial application at the Agricultural Machine-Building Plant imeni M. V. Frunze, where they are installed on pickup balers.

A major achievement of scientists in Kirghizia was the discovery of the phenomenon of the natural separation of isotopes of U^{234} and U^{238}. On the basis of this discovery, new methods were developed for modeling processes in the hydrosphere. These methods have found practical application in the republic in the geological service.

New designs for electrical generators of low-temperature plasma--plasmatrons--have been developed by scientists from Kirghizia and from the Siberian Branch of the USSR Acadmey of Sciences for use in monitoring the quality of industrial products.

Research is being successfully carried out in the fields of radio physics, solid-state physics and aerophysics. The principles of radio-wave propagation in mountain regions which have been established have made it possible to introduce passive relay stations for insuring reliable radio and telephone communications in the territory of the republic.

Associated with the utilization of the scientists' accomplishments is the development in Kirghizia of a promising scientific direction for the creation of automated control systems for continuous-production processes. The results of this research found application at the Kantskiy Cement and Slate Combine and later at other plants throughout the country. Together with the Kirghiz SSR Ministry of Construction, our scientists have developed and introduced at constructions trusts a multilevel automated system for the operational quality-control of construction and installation work.

Our republic's scientists also devote a great deal of attention to the development of agricultural science. Agriculture in Kirghizstan is becoming a more highly productive sector of the economy. With respect to the number of sheep and the production of fine and semifine wool, the republic occupies third place in the country, is a major supplier of high-grade mutton and produces sugar beets, cotton, vegetables, fruits, grapes and other crops.

The leading sector of agriculture is cattle raising, a fact that is reflected in the work of scientific establishments in the field of biology.

At the present time, scientists in the republic are directing their scientific research toward solving an important state question--the Food Program which was introduced in the resolutions of the 26th CPSU Congress and approved by the May (1982) Plenum of the CPSU Central Committee. In accordance with the assumptions and conclusions contained in the report of the CPSU Central Committee General Secretary Comrade L. I. Brezhnev at the Plenum, the republic's scientists are concentrating their efforts in the search for methods and in the development of recommendations for increasing the productivity of agricultural livestock and improving crop yields and the methods for treating livestock.

Our scientists have advanced practical recommendations for the creation of cultivated meadowlands and sown hayfields and for the improvement of the biological productivity and nutritional value of fodder from mountain pastureland through irrigation and the introduction of mineral fertilizer. In addition, they have advanced practical recommendations for the intensive utilization of mixed alfalfa and grass crops which will make it possible to increase the per-hectare yield of highly nutritious plant biomass to 700-800.

Research in the field of virology and microbiology has made it possible to study the biological characteristics of the sheep pox virus, cattle diarrhea and the natural tendency for certain infectious diseases of agicultural livestock to occur in localized outbreaks. Scientists have developed and produced a highly effective vaccine against sheep pox. This vaccine has been approved by the USSR Ministry of Agriculture and is being extensively employed in various sheep-fariming regions of the country.

One of the major major problems facing the scientists is the restoration and improvement in the productivity of the republic's forests. Forestry methods developed for the plains of the USSR's European sector are not suitable for the conditions found in Kighizia. This has made it necessary to organize extensive scientific research work based on local conditions. Experimental farms and control stations have been formed in the belt of pine, nut and juniper forests, while methods have been developed for farming pine trees using Tyan-Shan and other strains of pine.

For the first time, methods have been developed for farming juniper trees under the conditions found in Central Asia. These methods are being utilized by tree farms in Tadzhikistan. Recommendations have been developed for recouping our investment in walnut from commercial planting stock grown in Kirghizia. Stock plantations have been created in Uzbekistan, Tadzhikistan, in the Urals and in the Carpathians.

Scientists are devoting a great deal of effort to the development of methods for landscaping population centers in Kirghizia, to the problem of introducing plants of local and extraregional flora and the selection of flowering and fruit-bearing vegetation.

In the Botanical Gardens of the Academy of Sciences, our scientists have assembled one of the richest collections of plants, numbering more than 5,000 species. The hybrid stock of fruit-bearing vegetation consists of 6,000 forms of plant life.

The unprecedented spiritual progress of the peoples has been a triumph of Leninist national policy. It has found its practical embodiment in the accelerated development of research in the area of the social sciences. Scientific developments with

respect to the Kirghiz language and the young Kirghiz literature, including the most prominent popular epos, "Manas"--an inexhaustible depository of a millenium of experience and the wisdom of the people. It is an encyclopedia of the life of the Kirghiz people.

At the present time, the text of part I of a trilogy in the Kirghiz and Russian languages is ready for publication in Moscow in the series "Epos of the Peoples of the USSR." In addition, for the first time, a separate version of the first part of the writing is being published in four volumes as interpreted by S. Orozbakov.

The "Essays on the History of the Verbal Art of the Kirghiz People" was the important result of many years of research work in the field of Kirghiz folklore. This work reveals the history of the development of the rich and multi-genre Kirghiz folklore in the prerevolutionary and Soviet periods and characterizes its ideological and artistic features.

A great deal of attention is being devoted to the study of the correlations and interaction between Kirghiz literature and the literatures of the peoples of the USSR.

Our scientists have conducted a successful study of the history of the Great October Socialist Revolution, the history of the building of socialism and communism and the principles behind the historical development of society and the shift of socio-economic structures in Kirghizia.

The most major achievements of our scientists have been the preparation and publication of the "History of the Kirghiz SSR," the third edition of which (1968) was awarded the Kirghiz SSR State Prize in the area of science and technology. In this fundamental work based on a great deal of factual material, the history of the republic from ancient times up until the present is interpreted from the standpoint of Marxist-Leninist methodology.

Valuable materials have been obtained as a result of archeological and ethnographic expeditions. They reveal newer and newer pages in ancient history and the specific characteristics of the culture and life-style of the Kirghiz people.

Our scientists are successfully resolving problems associated with the progressive result of the Kirghiz SSR's voluntary entry into the structure of Russia and the national liberation and revolutionary struggle in Kirghizia at the beginning of the 20th century.

Great successes have been achieved in the study of the history of Kirghizia during the Soviet epoch. A number of scientific works have been published on the history of the Great October Socialist Revolution and the Civil War, on agricultural transformations and the building of the kolkhoz system, on the development of industry and on Soviet and cultural construction.

A noteworthy feature of the historical research of recent years has been the research done in cooperation with historians at higher learning establishments as well as with scientists from the fraternal republics of Central Asia and Kazakhstan.

The scientists of the Academy of Sciences have made a substantial contribution toward the solution of pressing regional problems in the development of the economy of Kirghizia. Our scientists' efforts have been directed toward the study of questions involving the development and allocation of productive forces. The results of this research were utilized by the rupublic's planning agencies in drawing up economic plans for the 7th, 8th, 9th and 10th Five-Year Plans. During the 10th and at the beginning of the 11th Five-Year Plan, our scientists devoted and continue to devote their primary attention to the development of long-term prognoses for the formation and development of the republic's territorial production complexes.

One of the leading trends in research is the study of the socioeconomic problems of mobility, the cultivation and utilization of labor reserves and the natural growth and migration of the population.

In accordance with the resolution of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, "On the Improvement of Planning and the Intensification of the Influence of the Economic Mechanism of Improving Production Efficiency and the Quality of Work," our scientists have proceeded with the development of "An Integrated Regional Program of Scientific and Technical Progress Throughout the Kirghiz SSR for 1986-2005 (in Five-Year Plans)" in cooperation with a number of scientific research and design establishments, institutions of higher learning and ministries and departments throughout the republic.

In the field of philosophy, our scientists are seeking a creative solution to problems associated with the building of communism and the education of people in a communist society. The scientists' subject of research is the principle behind the formation and establishment of the basic forms of of socialist consciousness and the history of social thought in Kirghizia. Our scientists' efforts are directed toward studying the methodology for an integrated approach to educating the new man and improving his moral character. In the areas of aesthetics and art criticism an in-depth study is being conducted of questions relating to the development the artistic culture of the poeples under conditions of socialism. Considerable attention is being deveoted to the process of integrating and uniting the national arts.

The solution to the pressing problems of contemporary art criticism and the study of the numerous aspects of things national and international in art and the lifestyle of the Kirghiz people are embodied in the major works of the Academy's scientists. With respect to the problems of the materialist dialectic, our scientists are studying a systematic process. With respect to the theoretical problems of the development of state and law, our scientists are investigating a complex of problems associated with the study of the Soviet national state and constitutional law-making, the legal regulation of collective-farming, land-management and civil legal relations and the strengthening of socialist law and order in the republic.

Question 3

The scientific establishments of the republic's Academy of Sciences are carrying out much research in cooperation with the academies of sciences of the union republics and, in particular, with the Academy of Sciences of Kazakhstan.

In the course of joint work in inorganic and physical chemistry among the Kirghiz SSR Academy of Sciences, the Kirghiz State University imeni the 50th Anniversary of

the USSR and the Institute of Organic Catalysis and Electrochemistry of the Kazakh SSR Academy of Sciences, our scientists are studying the catalytic activity of metallic catalysts and their capacity for oxygen and nitric oxide adsorption on their surfaces. They are also investigating the thermal stability of these catalysts and its dependence on phase composition.

The Institute of Organic Chemistry of the Kirghiz SSR Academy of Sciences is developing a technique for obtaining tomatozid neotchelenina (translation unknown) from waste materials for the Chimkentskiy Chemical and Pharmaceutical Plant imeni Dzerzhinskiy. Together with KazNIItekhfotoproyekt, the Institute of Organic Chemistry is creating a new method for obtaining sodium trichloroacetate with an enhanced degree of polymerization for a motion-picture film base with improved characteristics.

In the 11th Five-Year Plan, scientists from the Kirghiz SSR Academy of Sciences are concentrating their efforts on solving the pressing problems of the economy and culture of the republic and the country. Thanks to the relentless daily concern of the party and the government, excellent conditions have been created for thesuccessful conduction of scientific research. The creative collective has at its disposal the most highly qualified scientific personnel, while scientific stations, experimental shops and laboratories equipped with modern scientific apparatus have been created.

The tasks of the scientists of Soviet Kirghizia for the future are enormous. These tasks are, primarily, the study of the very rich mineral, raw-material, land and hydroelectric resources of the Issyk-Kul Oblast and the Chuyskaya Valley, the scientific basis of the Food Program, the development of mountain sheep raising and the introduction of the results obtained into the economy. The greatest significance is attached to the study of problems in the social sciences. These sciences are being called upon to contribute to the steady development of the economy, the upsurge in culture and the improvement in the communist education of the workers.

Under the wise leadership of our own Communist Party of the Soviet Union and its Leninist Politburo headed by today's outstanding political figure and statesman, General Secretary of the CPSU Central Committee and Chairman of the USSR Supreme Soviet Comrade Leonid Il'ich Brezhnev, the scientists from the Kirghiz SSR Academy of Sciences and from all of Soviet Kirghizstan are inspired by the resolutions of the historic 26th CPSU Congress. They devote all their efforts, knowledge and energies to new scientific achievements for the good of the Soviet people in the name of peace throughout the world and on behalf of the triumph of communism.

9512
CSO: 1814/70

IMPORTANCE OF GROUP LEADERS IN RAISING YOUNG SCIENTISTS

Frunze SOVETSKAYA KIRGIZIYA in Russian 5 Feb 83 p 4

[Article by A. Mamytov, vice president of the Kirghiz SSR Academy of Sciences and VASKhNIL academician: "If Your Name Is Scientist"]

[Text] "We are scientists"--this formula unites all of us who have embarked on the path of science. But is each of us specifically called on to be a scientist? What is science for us? And what are we for science? We observe the rapid, unswerving growth of science in the life of society, which is directly proportionally increasing the responsibility of each scientist to the motherland. After all, the respect with which the people treat scientists and the fund of faith in the might of human wisdom are built on the painstaking, daily work of all scientific subdivisions.

The question of the training and education of young scientific and scientific-pegagogical personnel is extraordinarily acute today. I was prompted to these notes by several figures. Some 391 students were enrolled in graduate study in the Kirghiz SSR Academy of Sciences in the 10th Five-Year Plan. Some 378 doctors and candidates of sciences worked with them. The state spent large resources in affording young people an opportunity to engage in research. And the result? Only 9 defended their theses and only 52 submitted their work for defense. And many young people were unable to corroborate their claim to the right to be scientists. Of course, there are many reasons why the vast majority of graduate students is completing its studies without having defended a thesis. They consist of the insufficient professional training and the personal attributes of the claimants. But they were selected in competition! They were, consequently, badly selected. The leaders of the graduate students must bear a certain responsibility. But have they ever been strictly held to account? I do not recall that they have. This is perhaps why one frequently observes indifference and a tranquil attitude toward the young people's breaches of elementary rules. Sometimes no one is bothered by the fact that a graduate student regards his work reluctantly, as if fulfilling a syllabus which has thoroughly bored him. Where here is the lively interest in and love for the chosen specialty! But since science has not become a daily requirement of life, why take up a place? And the comrades working alongside are distracted by the confused views: a person is in the laboratory only every now and then, that is alright, after all, not everyone can burn with enthusiasm. And some people become accustomed to living from youthful years on without a

love for their work, and nothing excites their thinking.... It is in such cases that a person begins to stray from the positions of scientific uprightness and cheats, adapting science to himself and living with interests which are alien to true science.

Encounters with young people endowed with an exorbitantly high opinion of themselves are frequent, unfortunately. And we have to speak primarily of inner culture here. For envy, egoism and arrogance are incompatible with the spirit and purpose of science.

There should be a healthy psychological climate and businesslike atmosphere in the scientific collectives conducive to creativity to the maximum extent and increasing the returns from each scientist and each collective. Teacher-pupil--this link is so important in science that when it is lacking, we must sound the alarm. For tomorrow is taking shape today from day-to-day connections and conduct. As the celebrated medical man Botkin aptly said, the teacher is the person who helped you discover yourself.

Many Kirghiz scientists can be proud of their pupils. Prof Ya.D. Fridman, for example. Those who once studied under him are now working in many corners of our motherland. His ideas are enjoying increasingly new development. For the creation of new biologically active compounds simulating active metalloferment centers and increasing animal vitality A.M. Moldogaziyev, V.F. Nazarov, Z.M. Pulatov and G.A. Tursunov, who worked under the leadership of Prof Ya.D. Fridman, were awarded Kirghiz Komsomol science and technology prizes.

The scientist's worth is determined primarily by the genuinely scientific approach and high effectiveness of his work. Academician Mikhail Nikolayevich Lushchikhin gave his entire life, strength and knowledge to the development of sheep breeding in Kirghizia. Back in the 1930's he began work for the first time in the republic on transforming the sheep breeds. The result of painstaking work was the fine-wooled breed. The Kirghiz fine-wooled sheep herd--the basic planning breed--is now over 9 million head. Following establishment of the breed, M.N. Lushchikhin began work on its further improvement. The scientist's dream was to make it the Kirghiz merino. The republic now delivers approximately 70 percent of merino wool, which puts the Kirghiz fine-wooled sheep among the best national breeds.

I knew Mikhail Nikolayevich Lushchikhin since 1945, attended his lectures and sat for official certification and routine examinations in zootechnics under him. He considered me his pupil. I was proud of this. I traveled with him a good deal and participated together with him in all-union and regional republic meetings and conferences and annual general assemblies of the KiSSR Academy of Sciences and the VASKhNIL. Live contact with M.N. Lushchikhin left me with unforgettable impressions of him as a remarkable man and major scientist who made a big contribution to the solution of scientific-practical problems of the conversion of fine-wooled sheep breeding. He serves as an example for the younger generation in the formation and development of a scientist.

Work on the methodology and geochemistry of sedimentary ore formation performed under the leadership of members of the KiSSR Academy of Sciences V.M. Popov

and M.M. Alyshev, who revealed the basic geological conditions and geochemical characteristics of the dispersion and concentration of nonferrous and rare metals in the Tyan'-Shan' mountains, has earned world recognition. It is being duly developed in the work of young scientists.

Under the leadership of O.D. Alimov, member of the KiSSR Academy of Sciences and USSR State Prize winner, a whole series of original machine tools for drilling and all-purpose drilling units has been created and introduced in production. Academician O.D. Alimov is known not only as a top scientist in the sphere of machine mechanics and mine engineering but also as a leading teacher capable of captivating the young people with ideas.

High moral fiber, consciousness, persistence, purposefulness and a self-critical approach--these are the basic requirements ensuring the success of any matter and any work. Scientific work all the more.

Our present is a worthy continuation of the past. If your name is scientist, this means that you are responsible for those who have resolved to embark on this thorny path of learning. And if you have resolved to become a scientist, be prepared for difficult routine and be prepared for the fact that much will be asked of you.

8850
CSO: 1814/66

HESITANCY IN INTRODUCING SCIENTIFIC DEVELOPMENTS IN KIRGHIZIA

Frunze SOVETSKAYA KIRGIZIYA in Russian 15 Jan 83 p 2

[Article by A. Maslinkovskiy, manager of the "Orgtekhstroymaterialy" Trust: "Science and Production: How To Consolidate the Connection?"]

[Text] An obvious fact: without fundamental scientific developments production cannot advance. Only on the basis of technical progress is it possible to tackle any practical task--whether it be an increase in labor productivity or a reduction in expenditure per unit output and the rational use of production capital or an increase in product quality. And if today a number of technical questions in the republic construction materials industry has been solved at the level of the best union enterprises and in terms of the manufacture of glass, efficient building materials and power consumption in brick production the sector has achieved the best indicators in the country, this is the result primarily of the close cooperation of the production workers and scientists.

However, despite such convincing proof of the general benefits of such collaboration, a considerable proportion of scientific research is as yet being introduced with difficulty, creakingly and half-heartedly and sometimes does not acquire a pass into practice at all. Why? Proceeding from the experience of our sector, I can cite the following factors impeding the implementation of many progressive ideas.

First, scientific workers engage in introduction work directly at the enterprises reluctantly, considering their functions to be completed at the stage of laboratory models, manufacture of test batches of products and the writing of an impressive report. Second, processes developed under laboratory conditions frequently do not produce the desired technical and economic result in practice since mass production engenders problems which research workers nearly always do not even suspect. Third, academic and VUZ science, let us speak plainly, is not entirely impressed with the importance and relevance of the tasks confronting our sector both in the near and distant future. Merely the fact that questions of construction materials technology related to chemical science are not reflected in the plans of the two chemical institutes of the Kirghiz SSR Academy of Sciences or are being tackled by them without regard for the concrete problems troubling the production workers serves as confirmation. And, fourth and finally, the lack of a modern experimental-industrial base prevents us verifying the laboratory result under production conditions, modeling an installation, obtaining an industrial model of a product and confirming or refuting a hypothesis.

But this is only one group of factors which in one way or another disunite the interests of science and production. On the other hand, however paradoxical this may seem, the enterprise workers themselves are very often not interested in the introduction of new equipment. This is a bothersome and risky business requiring the diversion of certain material and human resources and the reorganization of production. Many managers are taken up exclusively with concerns in connection with fulfillment of current quotas. Because, as Comrade Yu.V. Andropov observed at the CPSU Central Committee November (1982) Plenum, "for disruption of the production plan they are held responsible, but for the inadequate introduction of new technology they are reproved at most."

And this is why plans of the sector's development frequently contain long since obsolete production engineering principles which have been run in and tested, but which do not enable us to obtain products with the minimum labor, energy and material expenditure and new types of construction materials with predetermined properties which do not ensure waste-free production and also the comprehensive mechanization and automation of laborious processes.

Thus it transpires that science does not reach production, and it, in turn, does not go half-way toward science. Is this a normal situation? Of course not. We can only overcome this gap if we link the plans of scientific research work most closely with the plans of technical progress and the development both of the entire sector and individual enterprises. In short, it is necessary to begin with interconnected planning at all levels: science--design developments --planning--construction--adjustment--series production.

The basis of cooperation could be a joint 5-10-year plan of sectorial scientific research problems drawn up by the Academy of Sciences Presidium and the ministry Scientific-Technical Council determining scientific-technical policy in the sphere of the creation of new types of construction materials, the introduction of efficient techniques and so forth. The plan must be mandatory for all the sectors manufacturing analogous products--the Ministry of Rural Construction, the Glavkolkhozstroy and others. It should be made the basic section of the ministry's shop industrial and financial plan, the volume and specified times of the start of the production of each type of product and progressive, technically substantiated norms of production and raw material, fuel and power expenditure being determined on the basis thereof.

A scientific-technical center is being set up under the auspices of the KiSSR Academy of Sciences Presidium and the ministry for the general leadership of scientific-technical progress in the sector and supervision of the planning, development and introduction of individual programs and tasks. It would be expedient to transfer to it the problem-solving laboratories, whose main task will be research and the introduction in production of new materials, processes and so forth.

An important link in the "science--production" chain remain startup and adjustment organizations of the "Orgtekhstroymaterialy" type. They concentrate all the services which, having received from "big science" basic principles or ideas, can "adapt" them under the concrete conditions of industrial production, including the development of nonstandard equipment, projects and production

lines, choose the optimum introduction variant, perform startup and adjustment and supervisory installation work, help train worker personnel and do much else. Feedback should operate here: the scientific-technical ideas of the practical workers should be tested in the laboratories of the research institutes.

And the final important link in the chain of introduction of the achievements of scientific-technical progress is a modern experimental base. It is essential for testing the soundness and possibility of realizing a scientific idea, which makes it possible to cut the introduction time sharply. The base must have its own channels of supply and the appropriate capital, be equipped in accordance with the last word in technology and must be entirely self-supporting. Calculations show that to maintain production at a modern technical level it is necessary to annually invest in the creation of a testing-experimental base approximately 1-2 percent of the sector's total capital investments. This just to maintain it, but more, of course, for preferential development.

"We have big reserves in the national economy.... These reserves must be sought in an acceleration of scientific-technical progress and the extensive and rapid introduction in production of the achievements of science, technology and progressive experience.... Planning methods and the system of material incentive must contribute to science's combination with production." These words, spoken by Comrade Yu.V. Andropov, general secretary of the CPSU Central Committee, at the party Central Committee November (1982) Plenum, should be taken as a guide to fulfillment of the wide-ranging program of an acceleration of scientific-technical progress in the Kirghiz construction materials industry also.

8850
CSO: 1814/65

ACTIVITY OF TAJIK PRODUCTION EFFICIENCY EXPERTS

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 18 Jan 83 p 2

[Article by K. Masaidov, chairman of the All-Union Inventor and Efficiency Expert Society Tajik Republic Council: "Quest in All Areas"]

[Text] Republic All-Union Inventor and Efficiency Expert Society [VOIR] inventors and efficiency experts and activists are marching in single formation with the country's innovators. With their direct participation 18,000 inventions and efficiency proposals with an overall savings of R55 million were developed and introduced in the 2 years of the 5-year plan. This was R11 million more than in the corresponding period of the 10th.

The VOIR is one of the country's most populous public organizations. It currently has 12.4 million workers, kolkhoz members, engineering-technical and scientific personnel, students and trainees.

The republic primary organizations of the VOIR currently unite 72,000 technical creativity enthusiasts employed in practically all sectors of the national economy. In the past 2 years Tajik scientists and specialists have obtained over 200 patents on inventions. Many of them surpass in technical level similar facilities developed in the leading capitalist countries.

A principal area of the activity of the VOIR organizations is mobilization of the inventors' and efficiency experts' creative efforts for the accomplishment of the tasks of the intensification of the national economy. Socialist competition for achievement of the best results in invention and production efficiency work is developing increasingly extensively. It annually reveals dozens of the best collectives. Among these are the Tajik Aluminum Plant, the capital's "Tadzhikgidroagregat" Plant, the "Gidrospetsstroy" Nurek Construction Administration, the Yavan Electrochemical Plant, Kayrakkum Carpet Association, the Tajik SSR Academy of Sciences' Institute of Chemistry and others.

An integral part of the activity of VOIR organizations is the holding of varied reviews and competitions for the best proposal and the organization of technical creativity schools, exhibitions, seminars and lectures.

The society's primary organizations are performing a great deal of work on the development of collective technical creativity and an increase in the role of

the working people's public creative associations--composite efficiency expert creative brigades, public design and patent bureaus and innovator councils. There are thousands of such associations in the republic.

VOIR organizations responded warmly to the decisions of the CPSU Central Committee May (1982) Plenum. The past year brought much gratifying news of the new developments of innovators aimed at realization of the Food Program. The initiative of a number of progressive industrial enterprises for increased assistance to rural innovators in an improvement in the technical level of agrarian-industrial production is being extensively supported.

While noting what has been achieved the VOIR organizations clearly see the shortcomings and unused reserves in their work and are persistently seeking ways to increase its efficiency.

This year the VOIR will celebrate its 25th anniversary. Preparations for the Sixth Republic VOIR Congress, which will be held in March, are currently in full swing in the society's organizations. The efficiency experts and inventors are fully resolved to make an impressive contribution to the acceleration of scientific-technical progress and the creation of a R145 million efficiency fund of economies in the 11th Five-Year Plan.

8850
CSO: 1814/66

VUZ PREPARATION FOR PRODUCTION LIFE INADEQUATE

Ashkhabad TURKMENSKAYA ISKRA in Russian 5 Jan 83 p 2

[Article by G. Bagirov, chief of the central plant laboratory of the "Karabogazsul'fat" Production Association and candidate of chemical sciences: "Lack of Attention"]

> [Text] The 26th CPSU Congress pointed out that the close integration of science and production is an urgent requirement of the modern era. Finding ways of the most efficient use of scientific achievements in the name of the intensification of the development of the national economy--such is the principal task currently confronting the specialists of scientific research establishments and the higher school.

The country's chemical-engineering VUZ's remain the principal center of the training of highly skilled specialists for our chemical industry. At the same time the republic VUZ's, primarily the Turkmen Polytechnical Institute, must also make their contribution. Nonetheless, we constantly perceive an acute shortage of trained personnel. The point being that the young specialists who have come to us from student lecture halls more often than not fail to handle this role or the other of theirs on the job. Even in 3 years institute graduates do not fully grasp the structure of an enterprise. In each of them the process of the acquisition of professional independence proceeds with difficulty and complexity, is dragged out and frequently discontinued entirely. And this despite the favorable conditions which we are creating for the young specialists: high pay, housing and an atmosphere of benevolent mentorship. And yet people still leave.

However, this does not mean that we live without engineering research. In the 10th Five-Year Plan and the time of the 11th that has elapsed more than 20 major production efficiency proposals were introduced in our association. Who authored them? Engineering-technical personnel with higher education and many years of service.

As a rule, the engineering research of the young specialists who have settled down here is born mainly after 3-4 years of work.

Take, for example, M. Dzholdasov. He submitted the first efficiency proposals after having been on the job for 3 years and he has been working in the association since 1968. After 5 years he became chief of the seawater desalting shop. This is a complex process, but the young leader is handling his duties outstandingly; the shop's workers are fulfilling the plan with the best technical-economic indicators.

Or A.A. Ayazov. He has been working here for 25 years, 5 of which as chief engineer. He successfully defended his candidate's thesis without time off from work. A. Ayazov is currently general director of the production association.

B. Dikhanov graduated from the Polytechnical Institute in 1977. He may boldly be called a true master of production. Shift chief B. Dikhanov enjoys great authority among the association's workers. He is a communist and the acknowledged best propagandist. His shift is very harmonious and is struggling not only to fulfill the plan but also to economize on raw material, fuel and electric power and produce high-quality sulfate. There have been no labor and production violations in the collective for 2 years now.

But such specialists are few here, unfortunately. I will cite the following figure: of the 72 Polytechnical Institute graduates sent to us over a period of 17 years, only 8 are working currently.

The reason for such a sorry fact is to be found, I believe, primarily in the inadequate VUZ training. I will cite examples in this connection. The students fulfill the course and degree projects without, as a rule, having a concrete assignment. They are more often assigned outdated and inexpedient topics. For example, knowing that bischofite has for several years now been produced here without calcium chloride, the lecturers for some reason set topics precisely on calcium chloride. Not seeing how the desulfation process proceeds, the students employ merely archive material in their work. Frequently those working for degrees write works on identical topics. Yet no less than three topics, such as designing mirabilite, sodium sulfate and drying shops, may be developed in terms of the plant's production alone.

There are also many other reasons for the protracted maturation of the VUZ wards. Many of them have inadequate knowledge of material, thermal and technical-economic distribution. The role of industrial practice has been belittled and the graduates' on-the-job training is poorly organized in the institute. I believe that the VUZ should revise the structure of the curriculum, and, possibly, it is worth transferring many sections of the general engineering disciplines to the appropriate sector. The institute should know precisely for which enterprises it is training personnel and on the solution of precisely which problems of equipment, technology and the organization of production and labor its students will have to work. Strong multifaceted relations with the enterprise are needed for this. And what are they like here? We can answer briefly: there are none. Our representative is never seen in the VUZ lecturer councils. Nor are they present when the topics of course and degree projects are being assigned. Conversely, the participation of a representative of the institute in the enterprise's technical council, particularly when new developments and questions of the introduction of the

achievements of science and technology are being examined, is desirable. In a word, there are many problems in the personnel question. And as long as the shortcomings mentioned earlier continue, there can be no question of the high qualifications of the VUZ's students.

We production workers also expect considerably more assistance from science both in the organization of the manufacture of new products, an increase in production efficiency and the comprehensive use of raw material and in the introduction of modern equipment and progressive techniques making it possible to economize on fuel and electric power, improve product quality and increase labor productivity. In other words, the range of scientific work is extensive, and it is the wish that it develop, penetrate to the essence and manifest constant interest. But, again, is this possible without close contact? Of course not. In order to be conversant with matters a scientific worker, whether he is a candidate or doctor of sciences, must first of all spend some time at the enterprise and familiarize himself with its structure and development plan and the nature of the bottlenecks. This will enable the scientist to conduct not only exploratory research but also submit proposals for the present day.

Consequently, it is necessary to strengthen and develop business contract work. Technical councils, when the results of work performed in accordance with a contract by the Turkmen SSR Academy of Sciences' Institute of Chemistry, the Khar'kov Scientific Research Institute of Basic Chemistry and the Leningrad VNIIG are discussed, are, for example, very lively and involved. Currently the Khar'kov Scientific Research Institute of Basic Chemistry crystallization and automation laboratories are working on six business contracts here.

Unfortunately, this cannot be said about Turkmen scientists. The inadequate contact of the TuSSR Academy of Sciences' Institute of Chemistry, the Polytechnical Institute and University and other subdivisions with the association is a principal reason for the tardy introduction of new scientific developments in production. According to information, they exist, but production does not see them. For example, S. Karayev, a lecturer at the Polytechnical Institute, has for more than 15 years now been engaged in a study of the kinetics of chloridizing sulfate solutions under broad temperature conditions. But we are unaware of the results of the work. Yet it is much needed by us not only for obtaining mirabilite and epsomite sulfate but also for the comprehensive processing of raw material.

We receive for our comments many candidate's and doctor's works which have been written only on a basis of exploratory topics. Some of them are devoted to industrial operations and the activity of the association. But in the process of familiarization it transpires that the authors of these works do not know the outlines of industrial activity and the technological outline of the production of this product or the other. For example, female assistants of the Turkmen Polytechnical Institute brought their candidate's work for comments. But these works were totally unrelated to our production.

To what do these and similar facts attest? Research in the institute laboratories is inconceivable: it must be conducted in laboratory-industrial

spheres. Then the works of scientific personnel will be opportunely applied in production.

Such an atmosphere may be created only given joint work. Enterprise representatives should be part of the academic council of the TuSSR Academy of Sciences' scientific research subdivisions and VUZ lecturer councils.

Scientific research and planning-design work should be linked more closely--economically and organizationally--with production, the CPSU Central Committee report to the 26th party congress emphasized. Yet more than 90 percent of scientists are in scientific research institutes and higher and secondary specialized educational institutions. And there are virtually none of them at enterprises.

It should be emphasized once again that the scientist's place is alongside the practical worker. Science is rightly considered the first phase of the production process.

8850
CSO: 1814/66

ACTIVITY OF TURKMEN EFFICIENCY EXPERTS

Ashkhabad TURKMENSKAYA ISKRA in Russian 26 Feb 83 p 2

[Article by L. Kryuchkova, chairman of the All-Union Inventor and Efficiency Expert Society Turkmen Republic Council: "Conduits of Technical Progress"]

> [Text] The Sixth Turkmen All-Union Inventor and Efficiency Expert Society [VOIR] Congress opens today in Ashkhabad. The article below describes the activity and tasks of the republic VOIR members in the light of the decisions of the 26th CPSU Congress.

Scientific-technical progress has always been and remains the basic pivot of the development of our country's national economy. The discoveries, developments and inventions introduced in the national economy are contributing to the solution of many social problems.

In the 11th Five-Year Plan the development of science and technology is subordinated to an even greater extent to the accomplishment of economic and social tasks and the acceleration of the economy's transition to the path of intensive development and an increase in production efficiency. "We have big potential in the national economy," Comrade Yu.V. Andropov emphasized in his speech at the CPSU Central Committee November (1982) Plenum. "This potential must be sought in an acceleration of scientific-technical progress and the extensive and rapid introduction in production of the achievements of science, technology and advanced experience."

The decisions of the plenum elicited a warm response and support among inventors and efficiency experts in our republic. And this is natural. After all, for every innovator the quotas of the national economic plan are not only a concrete call to action but also the clearly delineated direction of creative quest.

The creative assertiveness of the republic's inventors and efficiency experts has increased considerably in the time that has elapsed since the Fifth Turkmen SSR VOIR Congress. The socialist pledges they adopted for the 10th Five-Year Plan were fulfilled a year earlier. A savings of R213 million was obtained from the use of their proposals in the national economy. Some 1,155

inventions and approximately 52,000 efficiency proposals were introduced in this time altogether. In 2 years of the 11th Five-Year Plan 345 inventions and approximately 20,000 efficiency proposals with a savings of R327 million were introduced in production.

The effect of the creativity of our innovators is measured not only by the savings in rubles. Many of the inventions and major efficiency proposals which have been introduced have made fundamental changes to the technology and techniques of production and are decisively influencing labor productivity and work conditions and the quality and technical level of products. Thus at the Ashkhabad Bakery the change in the processing phase of the milling of high-grade flour proposed by efficiency experts V.A. Balatov and N.N. Nasonov made it possible to improve the final milling of bran, increase the recovery of first-grade flour and make fuller use of installed production equipment. The savings is more than R100,000. A.R. Dzhorayev, efficiency expert at the Chardzhou Cotton-Cleaning Plant, developed and is introducing a proposal making it possible to reduce to a minimum the discharge of harmful substances into the atmosphere.

The ranks of VOIR society members have been reinforced in recent years by workers, kolkhoz members, young people and women. There are now more than 10,000 of them in the republic. There has been a considerable strengthening of the society's relations with the USSR State Committee for Inventions and Discoveries, the TuSSR Gosplan, TuSSR Academy of Sciences and ministries and departments. Permanent advice centers for assisting in the drawing up of claims to proposed inventions and patent research have been organized. These and other measures have exerted a positive influence on an improvement in invention work in the scientific research institutes, planning-design bureaus and VUZ's.

Patent subdivisions have been created and the patent study of topics has been introduced in certain scientific research institutes and VUZ's. All this has been reflected in a general upsurge in invention work and an increase in the number of inventions. For example, the patent department of the Turkmen Scientific Research Geological Prospecting Institute of the TuSSR Geology Administration conducts patent research in respect of topics which are being developed, evaluates the business possibilities of which developments which may be protected and prepares the material for foreign patenting. In the 10th Five-Year Plan the institute obtained 41 patents, that is, 50 percent of the claims submitted. Last year 19 positive decisions were obtained, and 12 inventions, furthermore, were patentable.

A whole number of inventions created in the TuSSR Geology Administration system represents a fundamentally new accomplishment of technical tasks and has been recognized by official expert appraisal as being of national economic significance. The use of just seven inventions produced a savings of approximately R1 million.

There has been an improvement in invention work in the Scientific Research Institute of Hydraulic Engineering and Land Reclamation, in the polytechnical and agricultural institutes, the "Turkmengiprovodkhoz" and the "TurkmenNIPIneft'". Unfortunately, in many other scientific research establishments and VUZ's invention and patent-licensing work is at a low level.

The innovators' socialist competition is being improved, increasingly more technical assistance is being rendered and control over the use in production of valuable technical innovations has been stepped up. At the center of attention of the VOIR republic council are such urgent questions as the innovators' participation in the implementation of measures to improve planning and streamline the economic mechanism, reduce manual and physically heavy labor and economize on and make rational use of material resources.

The majority of efficiency experts are workers--those who work at machine tools, service transfer machinery and control intricate apparatus. After all, it is they who come into direct contact with the merits and shortcomings of modern equipment and technology and are the first to ponder what therein could be changed and how. N.I. Kolosov, honored efficiency expert of the TuSSR and fitter-repairman of the Ashkhabad "Krasnyy molot" Gas Fixtures Plant, A. Kul'mamedov, foreman of the Cheleken Chemical Plant and honored efficiency expert of the republic, B.K. Dobychevskiy, foreman at the Chardzhou TETs and honored efficiency expert, P. Balovnev, fitter at the Ashkhabad Glass Works imeni V.I. Lenin, P. Nazarov, head of a department of the Polytechnical Institute, who has 30 valuable inventions to his credit, and many others are technical progress enthusiasts.

The growth of the working people's assertiveness in technical creativity largely depends on the level of leadership of the innovators' movement and the organization of inventors' and efficiency experts' competition. However, there are many serious shortcomings here. There are frequent instances of VOIR councils and management bodies adopting a purely formal attitude toward the adoption of pledges with respect to efficiency work and invention and failing to create the conditions for the realization of the innovators' creative plans. Such instances occur, for example, at enterprises of light and food industry, rural construction, construction materials industry and elsewhere.

Life dictates the need to ensure the intensive growth of the ranks of inventors and efficiency experts, improve the activity of the creative composite brigades and public design bureaus and accelerate the introduction of technical innovations. Much in the accomplishment of this task will depend on the ministries and departments and managers and their exactingness and correct organization of creative activity. Positive experience in this respect is being displayed by the leaders of the "Achakgazdobych" and "Shatlykgazdobych" associations, the "Karakumorgtekhstroy" Trust, the Tashauz "40 let TSSR" Repair Plant, Ashkhabad Passenger Auto Fleet No 3004, the "Nebitdagneft'" and "Leninneft'" oil and gas production administrations, the Chardzhou Knitwear Factory and a number of other enterprises.

Big and important tasks confront the republic's working people in the 11th Five-Year Plan. The main thing now is to strive for the efficient use of production potential, the utmost economies in resources and an increase in product quality. The big army of Turkmen inventors and efficiency experts is striving to make a fitting contribution to the accomplishment of the scheduled plans and the fulfillment of the socialist pledges adopted for 1983 and the 5-year plan.

8850
CSO: 1814/66

- END -